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MDCCCXXV.

Observations of the apparent distances and positions of 380 *double and triple Stars, made in the years* 1821, 1822, *and* 1823, *and compared with those of other Astronomers; together with an account of such changes as appear to have taken place in them since their first discovery. Also a description of a Five-feet Equatorial Instrument employed in the observations. By* JOHN FREDERICK WILLIAM HERSCHEL, *Esq. F. R. S. and* JAMES SOUTH, *Esq. F. R. S.*

Read January 15, 1824.

THE frequent and exact determination of the apparent distances and positions of such double stars, as are sufficiently close to be easily measured with micrometers and high magnifying powers, was suggested by Sir WILLIAM HERSCHEL, more than forty years ago, as an enquiry likely to lead to interesting results, and which has, in fact, in his hands, led to the creation of a new department of physical astronomy, and to the discovery of a class of phænomena in the sidereal heavens referable to the agency of attractive forces, and analogous to those produced by gravity within the limits of our own system. The immediate object with which the enquiry was commenced, the determination of the existence and amount of annual parallax, was soon lost sight of in the more extensive views of the construction of the universe which unfolded themselves as it advanced, and has not since been resumed; though, from the extreme precision of which it will appear in the course of this paper such measurements are susceptible, owing to the refinements of modern instrument-making (a precision not to be looked for in any other class

of celestial observations) and the progress we may yet hope for from farther improvements in this respect, there is every reason to suppose it still the most eligible mode of setting at rest that great question, and to believe that no distant period must put us in possession of something decisive from this quarter, as to the existence or non-existence of an appreciable amount of that element.

Meanwhile unexpected phænomena have been witnessed. The existence of binary systems, in which two stars perform to each other the offices of sun and planet, has been distinctly proved, and the periods of rotation of more than one such pair ascertained with something approaching to exactness. The immersions and emersions of stars behind each other have been noted, and real motions among them detected, rapid enough to become sensible and measureable in very short intervals of time.

The results of Sir WILLIAM HERSCHEL'S observations from 1779 to 1784, were published in two Catalogues in the Philosophical Transactions for 1782 and 1785, and consist of descriptions and measures of 702 double and triple stars. The labour of re-examination was undertaken and executed by him in 1801, 2, 3 and 4, after a lapse of twenty years; and the changes observed or suspected in them were recorded in two other papers, published in the volumes for 1802 and 1804. It was to be naturally expected that, owing to the imperfection of the micrometers with which many of the earlier measures, especially those of 1779 and 1780, were performed, and the novelty of the subject, many errors would have crept in; and that a verification of the facts, by farther observation, would at all events be highly desirable. Accordingly, in the

year 1816, a second re-examination of the measures was entered on by his Son (one of the authors of this paper), and some progress made in it; several of the results of which will be found attached to the measures in the following pages. The instruments in Mr. SOUTH's possession being peculiarly adapted to the purpose, a similar idea had also occurred to him; and, at his suggestion, it was determined to undertake the work of re-examination in concert, which was accordingly commenced in March, 1821, and continued, whenever weather and circumstances would permit, till the present time.

Meanwhile (though at that time unknown to us), a similar undertaking had been commenced and carried to a considerable extent by a very exact and assiduous continental astronomer, Mr. STRUVE, Director of the Imperial Observatory of Dorpat. The comparison of his observations of such of our stars as have been measured by him with our own, will not be found the least interesting part of the present paper. So far as it goes, the coincidences of our results, with very few exceptions, are striking; and afford the most satisfactory ground for reliance on the methods employed by both.

Professor AMICI, of Modena, has also of late occupied himself in the pursuit of the same object, with instruments said to be of extraordinary power. Very few, however, of his results have come to our knowledge, and those imperfectly stated; hence it may fairly be presumed that the differences existing between them and our own, will be found to admit of easy explanation.

The instruments employed in our combined observations, are two capital achromatic telescopes mounted equatorially, of the respective focal lengths of five and seven feet. These

are cited in the following pages by the names of the five-feet and the seven-feet equatorials; and a brief account of them, especially of the former, will neither be uninteresting to the practical astronomer, nor irrelevant to the objects of this communication.

Five-feet Equatorial.

The greatest part of this instrument, with regard to bulk, is constructed of tinned iron plate. Its characteristic qualities are great lightness, extreme steadiness, promptness in answering to its adjustments, and capability of retaining them.

The instrument, as represented in fig. 1, Plate I, is drawn on a scale of one-twelfth of the real dimensions. The view is taken at right angles to the plane of the declination circle. The polar axis is about ten feet and a half long. The lower end is a pivot attached to a cone, which, reckoning upwards, is about one-fourth of the whole length, the sides of this cone making with each other an angle of about fifty degrees. The higher side of the cone, for about a foot of its length, is cut in a sloping direction, as seen in the figure, for the purpose of more conveniently observing in the vicinity of the pole. From the upper end of the cone, the polar axis branches into two parts, between which is room for the declination circle and the head of the observer: these two branches are again united at the top by an open frame of bell-metal, represented in fig. 2, to which the upper pivot is attached; which frame, as well as the iron work which supports it, is so contrived, as to present the least possible surface to obstruct the telescope. For the same reason, the pivot at the top of the axis is made as small as possible, while that at the lower end is considerably larger. Both ends of

the axis are supported on stones; the northern one rising within about four inches of the level of the axis of the declination circle; the rest of the support being of wrought iron. At the southern end the stone rises very little above the floor, but a cast iron frame supports the pivot at the height of about two feet. The Y, or angle which receives the lower pivot, is placed upon the frame, and provided with two screw adjustments, one for giving the axis its due elevation, and the other for bringing the instrument to the meridian. The form of the iron-work above-mentioned will be sufficiently comprehended on consulting the different figures of the Plates.

The two branches of the polar axis, on their upper sides, are formed of broad planes, both making one continued plane. On these surfaces the axis and reading microscopes of the declination circle are fixed. The plane is as much above the line of centre as was judged would render the instrument self-balanced; but the declination circle, &c. having proved somewhat lighter than was expected, an equilibrium is effected by a weight fixed to the conical part of the polar axis. The diameter of the declination circle is four feet, the length of the telescope five feet, and the axis about thirty-two inches long. In Plate I, fig. 1, the declination circle appears quite plane, exhibiting the form of a drum-head, with the telescope looking towards the equator, and projecting at each end a little beyond the circle. In Plate II, the draughtsman stood close to the south pole of the instrument, on account of which, and its elevation, the polar axis is considerably foreshortened. In this figure the edge of the declination circle is shown as a short cylinder, the object-end of the telescope protruding beyond it. In this figure is also seen the shape of the

declination axis, and the two principal reading microscopes, viz. those which give declinations. There is a third microscope, which indicates zenith distances. This is seen in Plate I. fig. 1, between the eye end of the telescope and the instrument's elevated pole. In the latter figure is shown, on the extreme border of the drum, a narrow brass ring, whereon the graduation is made. This ring is not only narrow, but as thin as was judged consistent with sound workmanship; this slightness is necessary, because iron plate and brass expand very differently, but the former being much stronger, the latter must obey it: the brass is soldered to the iron, and also pinned to it at short intervals.

The hour circle, two feet in diameter, is fastened to the lower end of the polar axis, the edge of which is seen in Plate I. fig. 1, its under side in Plate II., and its face in Plate III. fig. 5. One of the reading microscopes is well seen in Plate I. fig. 1, and both of them, less perfectly in the other two figures. The whole of this circle was of brass, and the divisions were at first made upon that metal; but twenty-two years exposure to the atmosphere in the neighbourhood of London had obliterated the graduation. This has been restored by Mr. Troughton, upon an inlaid ring of platina, the divisions (fine lines) corresponding to twenty seconds each, which are subdivided by the microscopes to tenths of seconds. The declination circle is divided to five minutes, which are subdivided by the micrometer screw of the microscopes to single seconds, with a capability of estimating further subdivisions. The instrument is furnished with two good ground levels, neither of which are seen in any of the figures. The divided side of the declination circle has been called a drum; but the reverse is articulated;

showing how the conical parts of the axis and telescope are united, as well as the radial bars which proceed from the axis and telescope almost to the border of the circle, and how these bars, thin as the tinned plate is, are rendered firm and inflexible. It is on this side that the levels would be seen; one of them is parallel to the telescope, the other to the declination axis. In fig. 1, is seen the support of one end of the latter, above the polar axis, and nearly half way between the centre of the circle and its limb; here a circular aperture in the drum is represented as being quadrisected by a cross. This has, inserted in its centre, a small pivot or cylinder pointed inwards, upon which one end of the level is supported, while, on the articulated side, a cross and similar pivot support the opposite end. Both of the pivots are adjustable by screws, and the adjustment being duly performed by them, the horizontality of the axis is ascertained in every position of the telescope, when directed to the meridian. The other level, which is the larger, hangs upon similar adjustable pivots, which adjustment being performed, places the level parallel to the line of collimation of the telescope, serving at all times to ascertain the due elevation of the polar axis, as well as to answer many other useful purposes.

The clamps and screws for slow motion deserve notice; the former from being unusual, and both from being good. Instead of the common mode of clamping upon the circle, in this instrument the clamp is made to grasp the axis. There is soldered on each axis a ring of brass, the outer edge of which is broad and cylindrical. On this fixed ring a movable one is well fitted, and afterwards cut into three equal parts. These are again united at two places by joints, like

those which bind the different parts of a watch-chain together. At the third juncture the clamping takes place; a projecting part of the ring having been left where the third section is made, and a strong screw at right angles to this section, which is made to gape, brings the parts towards each other, and effects a firm embrace. The clamping apparatus, so far described, was avowedly borrowed from the means used for fixing the shaft of an ordinary wind-mill. To the middle of each of the trisected rings are fastened long arms of tinned iron plate, at the extremities of which the slow moving screws have their places. The fixed stud is in the lower screw planted in the iron support; that of the upper one in the polar axis; the moveable studs are of course connected with the levers.

The long screw for slow motion in right ascension is acted on by a contrate wheel and a pinion at right angles to the plane of the circle; a long handle attached to it is shown in Plate I, fig. 1, leaning against the northern pier. A similar screw for declination, but without the contrate part, is seen in Plate II, fig. 3. All the apparatus for clamping and slow motion is seen in Plates I, II, and III, figures 1, 3, and 5.

It may be remarked, that in the apparatus described, the right-ascension motion does not at all disturb that in declination; nor does that of declination affect the other: properties most essential to facilitate and render accurate, micrometrical observations; properties not to be expected, with the same precision, from those contrivances to which micrometers are usually attached, known by the name of equatorial stands.

The illumination of the wires of the telescope is produced by a small lantern, which has its place at one end of the

declination axis. There is a neat contrivance placed between the nosel of the lantern and end of the axis, by which the quantity of light is regulated, so as to suit the nature of any observation that may be made; and such is the amplitude of this illumination, that, on one hand, the brightness of broad day is produced, and on the other, total darkness. In any position of the telescope, and while the object is viewed, the adjustment of light can be conveniently effected, by means of a long handle shown in Plate I. fig. 1, hanging down on the hither side of the polar axis.

In Plate III. fig. 4, the eye-piece of the telescope is represented, in which there is seen the edge of a graduated circle, the front of a quadrant, and two small spirit levels. This apparatus is particularly described by Sir G. SHUCKBURGH, in the Phil. Trans. 1793; by which, and by some small tables given in his paper on the Equatorial, the corrections due to refraction and parallax are neatly allowed for, in observations made at a distance from the meridian. There is also seen in this figure, rather partially represented, a double parallel line micrometer (sometimes called a repeating micrometer), which also measures angles of position. Although this apparatus has had not a little to do with the observations recorded in this paper, it is forborne to give a detailed account of it: 1st., because it would considerably lengthen this description, which, it is feared, many will think too long already; 2dly, because a great number of these micrometers are in the possession of practical astronomers, and of course their construction is tolerably well known; and, lastly, because they have been described in our modern Encyclopædias.* It is

* REES's Encyclopædia, Article Micrometer. BREWSTER's ditto, ditto.

thought however, that the micrometer under consideration, was the first that had a position circle large enough to show distinctly minutes of a degree, by help of its verniers. This equatorial was designed to suit its first situation, viz. on the top of a house, where, to the north, higher buildings prevented any distant objects from being seen, and to the south, a smoky town presented almost as great an obstruction. The instrument being elevated 50 feet above solid ground, it became absolutely necessary that a permanent mark should from time to time be consulted. This advantage only presented itself to the westward, where, at a proper distance, the ground was not much below the level of the instrument; and to suit it to these circumstances, the declination axis was converted into a telescope. The effect produced by this, is similar to that of the Y level of the civil engineers, but with this difference: it is here required that each end of the axis should alternately be presented to the object, and that in reversed positions the telescope should have equal power. For these purposes, both ends have crossed wires, adjustable so as to be placed in the centres of their respective pivots. Exterior to the wires are placed object glasses of equal focal lengths, and an eye-glass, removable from one end to the other, completes the apparatus. The whole instrument having been adjusted astronomically, it was easy to build up a mark to the level of the axis, and also at right angles to the meridian, which afterwards became a substitute for a meridian mark, and also afforded an excellent mean for adjusting the reading microscopes of the hour circle.

The instrument bears no maker's name. The whole

scheme of its fabric was cast by the late Captain HUDDART, many years a worthy Fellow of this Society. All the tinned iron work was made, under the direction and inspection of the same able engineer. Under the like superintendence also, was the brass work made, by J. and E. TROUGHTON; who having furnished it with graduation, reading microscopes, levels, &c. completed the instrument in 1797. The excellent object-glass for the telescope of $3\frac{3}{4}$ inches aperture was made by the late P. and J. DOLLOND. The power ordinarily employed is 133; besides which, powers of 68, 116, 240, 303, and 381, were occasionally used, being double eyepieces; and in some few cases a single lens with a power of 578 was employed for the purpose of minute scrutiny. The extent of the field with these powers (in their order beginning with the lowest, 68) was respectively 34′, 31′, 20′, 19′, 13′, 11′, and . . . .

To preserve the tinned iron plate from oxidation, it has been well covered with white paint, and afterwards varnished; thus it has not only a neat appearance, but can be cleaned at any time, without difficulty.

The present situation of this instrument, in the immediate vicinity of one of the great thoroughfares of this immense metropolis, required the adoption of particular precautions against tremors. The northern pier is therefore sunk seven feet into the earth, where it is bedded on a Yorkshire flag four feet square, and two feet in thickness, into which the pier is firmly tenoned and fastened by stone wedges. From this flag rises a mass of brickwork to the level of the surface, surrounding the pier, and united with PARKER's cement, having the area of its horizontal section equal to that of the

flag. The weight of this effectually secures the stability of the foundation stone. The southern pier likewise consists of a large stone, two feet in thickness, resting on a bed of brick-work, carried downwards ten feet below the surface. So effectual are these precautions, that stars pass with perfect regularity along the whole extent of the declination wire, while the heaviest waggons are traversing the street within forty feet of the instrument, which, in one instance, has kept its adjustments, and been actually employed as a transit for six weeks, without sensible alteration. Indeed, whilst in Captain HUDDART's possession, it was almost exclusively used as a meridian instrument.

The object glass of the seven feet equatorial is the work of Mr. TULLEY, and may perhaps be regarded at present as the chef d'œuvre of that eminent artist. It is five inches in clear aperture, and in distinctness under high magnifying powers* is probably excelled by no refractor existing. Proof of this will be found in the separation and measurement of the most minute double stars, such as σ and η Coronæ Borealis, in its sharp definition of the double ring of Saturn, and various other of the most delicate celestial objects. It is mounted on a polar axis of brass, furnished with declination and hour circles of the same metal, the work of the late Mr. SISSON; being, in fact, those of the old equatorial sector of the Royal Observatory, committed to our care for this purpose by the Council of the Royal Society (to whom our thanks are therefore due) and of which a more particular de-

* Under favourable circumstances, with a power of 600, the discs of the two stars of η Coronæ and of σ Coronæ; of ζ Bootis and of ζ Orionis, are shown perfectly round, and as sharply defined as possible.

scription, accompanied with a plate, will be found in page 141 of VINCE's Practical Astronomy. The axis is supported by strong piles of wood sunk deep into the earth; and though not quite exempt from tremors, is sufficiently so for the performance (with due care) of the most accurate and delicate measurements. The telescope is furnished with a micrometer, the work of TROUGHTON, similar in all respects to that of the five feet just described, with the exception of a peculiar apparatus carrying an additional moveable cross wire, for a purpose not connected with the present paper. The ordinary observing power employed with this telescope was 179, but occasionally a lower power of 105, and a higher one of 273, were also used. The illumination of the field is effected by a lamp attached to the tube, and (as in the five feet), may be increased or diminished to any extent.

The values of the parts of the scale of each micrometer were determined by separating the wires a certain known number of revolutions and parts, and having placed them in the direction of the meridian, measuring repeatedly the time occupied by the passage of an equatorial star, or other of known declination, from wire to wire. By this method, one part of the scale of the five-feet micrometer was ascertained to represent 0″.31582, and of the seven feet, 0″.24044. The equality of the threads of the screw was proved by the same value resulting, whatever opening of the wires was employed; and the parallelism* of them in either micrometer was perfect. The position of the declination wire, when set to zero, was frequently examined by running a star

* The wires employed in these micrometers, are spider's lines of *extreme* tenuity, and were inserted by Mr. SIMMS.

from one end to the other, backwards and forwards, by the right ascension motion of the instrument; but being once well adjusted, was found liable to no change, except in one instance, when the micrometer had received a blow, the defect produced by which was immediately discovered and rectified.

Respecting the precautions used in observing, a few words will suffice. In measuring distances, the stars were bisected by both wires, and kept on them by means of the long handle of the slow R. A. motion, held in the left hand, and gently turned between the finger and thumb, the right being at liberty to manage the micrometer. This, though rather difficult at first, becomes easy by a little practice, and even in unfavourable positions, the effect of the earth's diurnal motion may be almost exactly neutralised with a little management. The measures of distance are therefore all *central*, a circumstance the more necessary to be noticed, by reason of the greater size of the spurious discs of stars in refracting, than in reflecting telescopes. In taking angles of position, these spurious discs are often extremely troublesome, as their inequality renders it very difficult (especially in close stars), to judge of the position of the line joining their centres. In such cases a green, or even a slightly smoked glass, was sometimes used in viewing bright stars, or advantage taken of the favourable intervention of a thin cloud, which reduces them to mere points, or even of broad daylight, to obliterate their rings and scattered light, &c. Such cases are noticed when they occur, but it may not be amiss to mention, that the angle of position of a pair of very close stars, or very unequal ones, at a moderate distance, (such as ϵ Bootis, β Orionis, &c.), can never be obtained with any degree of certainty by a single

measure, especially when the two stars, as in the above instances, differ greatly in colour.

The requisite degree of illumination is a matter of great consequence, and differs in almost each particular star. In relation to this, a singular phænomenon deserves mention. Many very minute stars bear, without extinction, strong degrees of illumination, and are even seen the better for it, while others, apparently brighter, have been found unable to bear even the slightest extraneous light. This may probably be owing to an excess of blue light in the star, forming a contrast with the ruddy tint of the lamp illumination: at least, the most remarkable instances* of the phænomenon in question are, those in which the small star is decidedly of a blue colour.

A rather singular method of obtaining a view, and even a rough measure of the angles of stars of the last degree of faintness, has often been resorted to, viz. to direct the eye to another part of the field. In this way, a faint star in the neighbourhood of a large one, will often become very conspicuous, so as to bear a certain illumination, which will yet *totally disappear*, as if suddenly blotted out, when the eye is turned full upon it, and so on, appearing and disappearing

* σ *Scorpii* is much improved by illumination.

η *Lyræ*. Small star blue. Much improved by strong illumination.

ι *Trianguli*. Small star blue. Bears illumination very well.

η *Persei*. S. blue. Extremely faint, yet bears illumination well.

59 *Serpentis*. S. blue; and though only of 9 m., yet *bears all the illumination*.

22 *Monocerotis*. S. blue, and bears the illumination well, while a small white star near it bears it ill.

θ *Virginis*. The extremely faint small star bears a good illumination.

51 *Piscium*. S. of a ruddy plum colour, and bears a very bad illumination in proportion to its size (7 feet equatorial.)

alternately, as often as we please. The small companion of 23 (h) Ursæ Majoris, is a remarkable instance, and others will be found in the note.* The lateral portions of the retina, less fatigued by strong lights, and less exhausted by perpetual attention, are probably more sensible to faint impressions than the central ones, which may serve to account for this phænomenon.

The measures were, for the most part, taken by both observers in each other's presence, the one acting as assistant, and writing down what the other announced. Frequently, however, this disposition, dictated by convenience, was changed, and the observations made by one were read off, as well as written down, by the other, and the results not communicated till the measures were finished. This mode of checking each other's measures, the severest which can well be resorted to when two persons observe *together*, was however only adopted, when, from a discrepancy in the first measures, some suspicion of a bias in the eye, or judgment of one or other, arose, in cases of peculiar interest, or in the earlier part of the work, before practice had confirmed our confidence. When the two instruments were used at once however, which during the last year's observations was almost perpetually the case, the observers were necessarily separated from each other, and their results only communicated on the following morning, at the time of taking and applying the index errors.

In a very few instances, the assistance of a third person has been called in, to give a turn to our opinion in a doubtful case. Mr. RICHARDSON, of the Royal Observatory, has generally

* ζ Persei; 7 Tauri; 43 Persei; ι Leporis (R. A. $5^h. 4^m.$); 63 (p.) Geminorum.

been the person selected for this purpose, as possessing the necessary qualifications of an eye practised* in observations with this particular instrument, a correct hand, and unbiassed impartiality. A few measures by Mr. TROUGHTON will also be found on similar occasions.

Of the general disposition of the following paper, it will now be necessary to give some account. The stars observed by us, are arranged in order of right ascension, and such names, synonyms, and references are attached, as will serve to identify them in the writings of other astronomers. The catalogues of Mr. SOUTH† and Mr. STRUVE,‡ have been extremely useful to us; the latter being much more extensive than the former, the number of each star, in the order in which it stands in that work, is annexed: the synonyms therein given are also generally adopted, with such additions and corrections as seemed necessary.

Our observations will be found to include many stars given by Sir WILLIAM HERSCHEL, in his catalogue of 145 new double stars, printed in the Memoirs of the Astronomical Society, Vol. 1. These are cited by their numbers (for instance, 41 of the 145.) Some few discovered by ourselves, are either mentioned as new, or may be known by the absence of any other reference. The right ascensions and declinations are generally those of STRUVE. When de-

* Prior to his appointment at Greenwich, Mr. RICHARDSON, by daily experience, had been long familiar with the Blackman-street instruments.

† This catalogue was arranged in the year 1818, by Mr. S. and was intended for private use *only*; at the request, however, of the Reverend Dr. PEARSON, it was communicated to the Astronomical Society, in the spring of 1820.

‡ This catalogue, *unfortunately*, did not reach us till the commencement of the present year.

termined by ourselves, they may be regarded as true to the nearest minute in declination (unless for southern stars, where the neglect of refraction will entail a larger error), and to a few seconds in R. A. The identification of the stars being our only* object, greater accuracy was not attempted, than would suffice for setting the instrument directly upon them.

Next follow our observations as written down at the time, or at least as allowed to stand, at the moment of terminating the measure. It would have been easy indeed, by giving only the mean results of whole sets of measures, to have produced an appearance of very exact coincidences; but this has not been so much our object, as to show, by an actual exposé of the whole work, what degree of confidence is due to our results, and what extent of deviation from mean quantities, other observers, who may enter upon the same enquiry with similar instruments, may fairly expect to meet with. In this respect, very few liberties have been taken.

* To have rendered this paper as complete as possible, it was Mr. SOUTH's intention to have accompanied it with the observed places of each *principal* star, brought up to a particular epoch, and some progress towards effecting it was actually made so far back as February, 1821: but, although the transits of fifty stars, over *all* the wires of his instrument, were occasionally observed by him in *one* night, the scheme was found to interfere so much with the *primary* object, that it was deemed advisable to relinquish it. Should, however, their places remain undetermined, possessing, as he does, the *instrumental* means of ascertaining them, with the greatest accuracy, his original design, (if health allow), will probably be not abandoned. Still, it must be remembered, that, two or three hundred double stars yet remain unmeasured; this done, the period must be distant, ere a private individual can, *with his own eyes*, (be his industry great as it may), furnish *standard* observations, both in Right Ascension and Declination, of seven hundred stars, many of which are only visible in the illuminated fields of our large meridian instruments, under circumstances which, in this country, are of very rare occurrence.

When indeed a measure (on looking down the list, without reference to the observations of former nights) was found to differ considerably from the rest, the micrometer was usually set to the suspicious reading off, and the measure re-examined by both observers. If declared erroneous (and the contrary would occasionally happen), it was corrected by him whose measure it originally was, and the result set down in the place of that rejected. In general, the degree of discordance in the measures of any particular star, may be taken as a pretty fair criterion of the difficulty which attended the observation.

The instrument with which each set of measures was taken, is mentioned. In the north preceding and south following quadrants, the micrometers show angles of position complementary to the true ones. These are, however, (except in one or two instances) set down as read off, and the mean afterwards subtracted from 90°. In the measures of distance, the index error is applied to the mean of the micrometer parts in each set, and the result reduced into seconds is stated. The index error was at first only taken at pretty considerable intervals; but, being soon found liable to a trifling change, it was afterwards regularly taken on the morning after each night's observation, or at least as soon as circumstances would permit. The zeros applied are means of at least five, but frequently of ten separate determinations.

In order to make this paper more complete, and to save trouble to those who may wish to consult our measures, or prosecute farther this interesting department of astronomy, we have presented at the end of our observations of each star, 1st, the mean result of our own measures, reduced to a mean

epoch, in computing which, each single measure (unless the contrary is expressly mentioned) is supposed to have the same weight: and, 2dly, a brief statement of all the results obtained by other observers, as far as they are known to us, arranged in the order of their dates, for the sake of comparison with our own, so as to give, as it were, a history of all that is known on the subject. Among them, a multitude of hitherto unpublished observations of Sir W. HERSCHEL are inserted from his Journals and Registers; many lacunæ in the history of particular stars filled up, and the chain of observation continued unbroken up to the present time. One or two points here require notice. 1st. The dates of his observations will generally be found to differ from those attached to the description of the stars in his Catalogues. The reason is, that the dates here given are those of the observations, as they occur in the Journals, or their mean, if more than one, while the dates in the Catalogues are those when the stars were first discovered to be double. 2dly, Both the angles and distances will also be frequently at variance with those printed in Sir WILLIAM'S Catalogues. This must be explained more at large. Unless a *mean* result is expressly mentioned, the angles and distances in his Catalogues are invariably the results of single measures. However numerous the measures taken, one has been selected as the best, and all the rest rejected. So great a degree of confidence in single measures, however, is hardly borne out by our experience; and the results we have inserted from the Journals and Registers, are therefore the means of all that could be found, such only being rejected as offer something obviously objectionable. We have only to cast our eyes at the obser-

vations of Rigel, to see how widely they differ from each other, and yet how exactly their mean agrees with that of our own, to be satisfied that, in so doing, not only no improper liberty is taken, but much valuable labour rescued from oblivion, which would otherwise have been lost to science. In numerous instances, too, whole series of observations have been found, and their mean results inserted. These are generally noted by the letters MSS. annexed.

Finally, such remarks are subjoined as comparisons of modern with ancient measures of the same star suggest. In numerous instances they confirm the changes previously surmised to have taken place by Sir W. Herschel, in his papers of 1803 and 1804. In a few they afford no such satisfactory confirmation. In more than one instance, they furnish important verifications of the proper motions assigned to particular stars by Maskelyne, Piazzi, and others; while in some, on the other hand, the degree of permanence in the relative situations of the large and small stars is hardly less remarkable.

After the main body of observations, we have added a list of a few stars less perfectly measured, or of which, from their uncommon difficulty, the observations are too precarious to be received as satisfactory. The only reason for inserting them is, that should there ever hereafter arise a question respecting them, any measures made with some care and with good instruments are better than none at all, and *may* become useful, though confessedly imperfect data. This reason is strengthened by the probability that their difficulty, and the little apparent interest they offer, will cause them to be dis-

regarded by future observers, till peculiar views occur to recal them to attention.

For the convenience of those who may wish to examine the micrometrical reductions, we have subjoined the following tables.

Values of Five feet Equatorial Micrometer.

Rev.	′ ″	Parts.	″	Parts.	″	Parts.	″	Parts.	″	Parts.	″
1	0.31.582	1	0.316	26	8.211	51	16.107	76	24.002	.1	0.032
2	1. 3.164	2	0.632	27	8.527	52	16.423	77	24.318	.2	0.063
3	1.34.747	3	0.947	28	8.843	53	16.739	78	24.634	.3	0.095
4	2. 6.329	4	1.263	29	9.159	54	17.054	79	24.950	.4	0.126
5	2.37.911	5	1.579	30	9.475	55	17.370	80	25.266	.5	0.158
6	3. 9.493	6	1.894	31	9.790	56	17.686	81	25.582	.6	0.189
7	3.41.075	7	2.211	32	10.106	57	18.002	82	25.897	.7	0.221
8	4.12.658	8	2.527	33	10.422	58	18.318	83	26.213	.8	0.253
9	4.44.240	9	2.842	34	10.738	59	18.633	84	26 529	.9	0.284
10	5.15.822	10	3.158	35	11.054	60	18.949	85	26.845		
11	5.47.404	11	3.474	36	11.370	61	19.265	86	27.161		
12	6.18.986	12	3.790	37	11.685	62	19.581	87	27.477		
13	6.50.569	13	4.106	38	12.001	63	19.897	88	27.792		
14	7.22.151	14	4 422	39	12.317	64	20.212	89	28.108		
15	7.53.733	15	4.737	40	12.633	65	20.528	90	28.424		
16	8.25.315	16	5 053	41	12.949	66	20.844	91	28.740	.01	0.003
17	8.56.897	17	5.369	42	13.265	67	21.160	92	29.056	02	0.006
18	9.28.480	18	5.685	43	13.580	68	21.476	93	29.371	.03	0.009
19	10. 0.062	19	6.001	44	13.896	69	21.791	94	29.687	.04	0.013
20	10.31.644	20	6.316	45	14.212	70	22.108	95	30.003	.05	0.016
21	11. 3.226	21	6.632	46	14.528	71	22 423	96	30.319	.06	0.019
22	11.34.808	22	6.948	47	14.844	72	22.739	97	30.635	.07	0.022
23	12. 6.391	23	7.264	48	15.159	73	23.056	98	30.951	.08	0.025
24	12.37.973	24	7.580	49	15.475	74	23.371	99	31.267	.09	0.028
25	13. 9.555	25	7.895	50	15.791	75	23.687	100	31.582		

Values of Seven-feet Equatorial Micrometer.

Rev.	′ ″	Parts.	″	Parts.	″	Parts.	″	Parts.	″	Parts.	″
1	0.24.044	1	0.240	26	6.251	51	12.263	76	18.274	.1	0.024
2	0.48.089	2	0.481	27	6.492	52	12.503	77	18.514	.2	0.048
3	1.12.132	3	0.721	28	6.732	53	12.743	78	18.754	.3	0.072
4	1.36.177	4	0.962	29	6.973	54	12.984	79	18.995	.4	0.096
5	2. 0.221	5	1.202	30	7.213	55	13.224	80	19.235	.5	0.120
6	2.24.266	6	1.443	31	7.454	56	13.465	81	19.476	.6	0.144
7	2.48.310	7	1.683	32	7.694	57	13.705	82	19.716	.7	0.168
8	3.12.354	8	1.923	33	7.935	58	13.946	83	19.957	.8	0.192
9	3.36.398	9	2.164	34	8.175	59	14.186	84	20.197	.9	0.216
10	4. 0.443	10	2.404	35	8.415	60	14.427	85	20.438		
11	4.24.487	11	2.645	36	8.656	61	14.667	86	20.678		
12	4.48.531	12	2.885	37	8.896	62	14.907	87	20.918		
13	5.12.576	13	3.126	38	9.137	63	15.148	88	21.159		
14	5.36.620	14	3.366	39	9.377	64	15.388	89	21.399		
15	6. 0.664	15	3.607	40	9.618	65	15.629	90	21.640		
16	6.24.709	16	3.847	41	9.858	66	15.869	91	21.880	.01	0.002
17	6.48.753	17	4.087	42	10.099	67	16.110	92	22.121	.02	0.005
18	7.12.797	18	4.328	43	10.339	68	16.350	93	22.361	.03	0.007
19	7.36.842	19	4.568	44	10.579	69	16.591	94	22.602	.04	0.010
20	8. 0.886	20	4.809	45	10.820	70	16.831	95	22.842	.05	0.012
21	8.24.930	21	5.049	46	11.060	71	17.071	96	23.082	.06	0.014
22	8.48.975	22	5.290	47	11.301	72	17.312	97	23.323	.07	0.017
23	9.13.019	23	5.530	48	11.541	73	17.552	98	23.563	.08	0.019
24	9.37.063	24	5.771	49	11.782	74	17.793	99	23.804	.09	0.022
25	10. 1.107	25	6.011	50	12.022	75	18.033	100	24.044		

Blackman Street,
Nov. 19, 1823.

J. F. W. HERSCHEL.
J. SOUTH.

No. I. R. A. $0^h\ 6^m$; Decl. $7^\circ 49'$ N.

35 Piscium; STRUVE 4; III. 62;

Large white; small blue, bearing illumination very well.

Position.	Nov. 27, 1821.	Distance. Parts.
° ° ′	Five feet Equatorial.	
90—30. 9 (S)	*sf.*	36. 0 (S)
29.30 (S)		35. 8 (S)
29. 0 (S)		37. 0 (S)
28.52 (S)		36. 0 (S)
29.43 (H)	Position $= 60^\circ.46'$ *sf.*	34. 5 (H)
28.46 (H)		35. 0 (H)
29.27 (H)	Distance $= 11''.168$	34. 1 (H)
28.38 (H)		38. 0 (H)
		34. 9 (H)
Mean = —29.14		Mean = 35.70
		Z = — 0.28
		35.42

Sir WILLIAM HERSCHEL measured this star on the 30th of June 1783, and his measures, as recorded in his Second Catalogue, Phil. Trans. 1785, are

Position $58^\circ\ 54'$ *sf.* Distance $12''.50$,

so that this star has undergone no material alteration. M. STRUVE (Dorpat Obs. iii.) has four sets of measures, the mean result of which is

1821.45; Position $62^\circ\ 12'$ *sf*; $\triangle$ declin. $= 9''.875$; whence distance $= 10''.591$.

No. II. R. A. $0^h\,8^m$; Decl. 7° 51′ N.

38 Piscium; STRUVE 5; II. 50;

A very close and faint double star; moderately unequal; very difficult.

Dec. 11, 1821.

Five feet Equatorial.

s p

Position. ° ′		Distance. Parts.	
29.30	H	15. 5	H
30.27	H	16. 1	H
30. 4	H	14. 9	H
31.39	H	17. 4	H
33.13	S	15. 2	S
32.45	S	14. 4	S
33.13	S	15. 8	S
33. 8	S	16. 5	S
33. 5	S	16. 0	S
32. 8	H		
34. 0	H		
33. 6	H		
31.42	H		
Mean = 32. 9		Mean = 15.75	
		Z = − 0.02	
		15.73	

Position = 32°.9′ *s p*

Distance = 4″.967

This star was measured by Sir W. HERSCHEL in 1783, and 1802. His first observation gives 25° 3′ *sp* for the angle, while by the measure of 1802, it appeared to be 34° 33′ *sp*. It is therefore enumerated by him among the stars in which a motion is suspected; but our observations do not confirm the suspicion. In the Journal of 1783, his measure is set down 1 Rev. + 49 ½ — 46 ½; 49 ½ parts, or 19° 48′, being the correction for Zero. If we suppose a mistake in reading off, and that the true measure were 3 Rev. — 49 ½ — 46 ½, all the observations would agree, as this corresponds to 33° 27′ *sp*; and some peculiarities in the mode of setting down the observations of that night, make this not improbable.

1821.45. Position 33° 48′ *sp*; STRUVE, Dorpat Obs. iii. p. 133, 134, 143.

The distance in 1783 was two diameters of the large star, and in the Journal of 1782, it is mentioned as "2d class, far." The distance therefore has undergone no considerable change.

No. III. R. A. $0^h\ 23'$; Decl. $5°57'$ N.

51 Piscium; STRUVE 7; IV. 70;

Small star; ruddy, or plum coloured; 6th and 9th, or perhaps 10th magnitudes.

Nov. 13, 1823.

Seven feet Equatorial.

nf

Position.		Distance. Parts.	
° ′			
7.45	S	113. 0	S
7.51	S	113. 0	S
6.53	S	111. 2	S
6.50	S	112. 5	S
6.55	S	111. 5	S
7.30	H	109. 5	S
7.33	H	105. 0	H
6.15	H	119. 0	H
6.50	H	116. 5	H
6.35	H	105. 3	H
8. 5	H	107. 6	H
		115. 0	H
Mean = 7.11		Mean = 111.59	
		Z = − 4.01	
		107.58	

Position $= 7°.11'$ *nf*

Distance $= 25''.866$

Measures difficult, small star, bears only a bad illumination.

The position, Aug. 19, 1783, was $0°.36'$ *nf* (Second Catalogue). As a slight deviation from the parallel is easily perceived, this measure, could not possibly be 7° in error, and the position must therefore have altered; though from the great difficulty of the measures, it is impossible to speak positively to the amount of the change.

The distance in 1783, was $22'',48$. A MS. observation of Sep. 4, 1782, makes it $20''.57$ "not exact." A comparison of these with the present distance, renders it probable that the stars are receding from each other.

M. STRUVE makes the angle $7°\ 6'$ *nf* by 4 measures taken 1820.95. Dorpat Obs. iii. 1820. Obs. 69 and 90.

No. IV. R. A. $0^h\ 27^m$; Decl. $32°\ 43'$ N

π Andromedæ; Fl. 29; STRUVE 10; V. 17;

Nov. 12, 1821.

Five feet Equatorial.
sf.

Position. ° ° ′		Distance. Parts.	
90—4.31	H	114. 2	H
3.58	H	117. 0	H
4.47	H	115. 0	H
4. 0	S	115. 1	H
3.46	S	114. 0	S
4. 5	S	115. 9	S
4.12	S	115. 2	S
		116. 4	S
		116. 9	S
Mean = —4.11		Mean = 115.52	
		Z = — 1.44	
		114.08	

Position = 85°.49′ *sf.*
Distance = 36″.029

Nov. 23, 1821.

Extremely unequal; small star; will bear but little illumination.

Five feet Equatorial.
sf.

Position. ° ° ′		Distance. Parts.	
90—5.15	H	111. 0	H
4.42	H	115. 0	H
5. 9	H	Mean = 113. 0	
5.14	H	Z = — 0.28	
5.11	H	112.72	
Mean = — 5. 6			

Position = 84°.54′ *sf*
Distance = 35″.599

Mean result; Position 85° 26′ *sf*; Distance 35″.951; 1821.88.

The distance appears to have undergone no material alteration since July 21, 1781; when it was found to be 34″.20, as stated in the Catalogue of 1782, "inaccurate."

No. V. R. A. 0^h 30^m; Decl. 55° 33′ N.

α Cassiopeiæ; STRUVE 11; V. 18;

Double; exceedingly unequal; the small star will scarcely bear the least illumination.

Position.	Nov. 23, 1821.
90°—83°.42′ } H 81. 0 81.41	Five-feet Equatorial *n p.*
Mean = — 82.8	Position = 7°.52′ *n p.*

Position, as stated by former observers.

1781,	(Dec. 19)	(MSS correction of the Catal. of 1782)	5° 26′ *n p.*
1816.2,	STRUVE.	Dorpat Observations, Vol. i. Pars ii. Cat. i. p. 3; - - -	9 39 *n p.*
1819.9,	Ditto,	Ditto, Additamenta, i. 181.	9 3 *n p.*
1820.17,	Ditto,	Dorpat Obs. iii. Obs. 27.	8 48 *n p.*

Distance.

1780,	Aug. 31.	Catalogue of 1782.	52″.812
1781,	Dec. 19.	MSS. Journal (H)	56 .167
1819.9,	- -	STRUVE, Additamenta 181.	58 .8
1815.2,	- -	Ditto, Catalogus i. p. 3.	59 .4

By this statement, the position seems to have remained nearly constant, but the distance to have undergone an evident increase. The observation of 1781, as given in the Catalogue of 1782, states the angle at 40° 58′ *n p*, which is a mistake of computation or printing. It has misled M. STRUVE into the conclusion of a binary system and elliptic orbit.

No. VI. R. A. $0^h\ 37^m$; Decl. $29°\ 58'$ N.

142 (Bode) Andromedæ; Struve 12; V. 123;

Nearly equal. Pale, ill-defined stars.

Nov. 29, 1821.

Five-feet Equatorial.

nf or *sp*

Position. ° ′	
32.39	S
32.30	S
32.15	S
31.52	S
Mean = 32.16	

Position = 32° 16′ *nf* or *sp*.

Dec. 17, 1821.

Position = 34° *nf* or *sp* (*s*) Single measure.

Dec. 21, 1821.

Five-feet Equatorial.

nf or *sp*.

Position. ° ′		Distance. Parts.	
34.1	S	147.0	S
34.55	S	147.6	S
35.15	S	148.6	S
35.34	S	147.8	S
35.30	S	147.2	H
35.12	S	147.4	H
34.19	H	147.9	H
33.50	H	Mean = 147.64	
33.43	H	Z = −0.52	
34. 2	H	147.12	
34.41	H		
Mean = 34.38			

Position = 34° 38′ *nf* or *sp*.

Distance = 46″.464

Mean result 34° 0′ *sp*; Distance 46″.464; 1281.95.

Sir Wm. Herschel's measures of 1783, Jan. 13, are

Position 32° 24′ Distance 45″.02

In neither particular therefore does this star appear to have altered materially.

No. VII. R. A. 0h 37′; Decl. 50°7′ N.

V. 82; STRUVE 13;

8 and 8½ magnitudes.

October 16, 1823.

Five-feet Equatorial.

nf.

Position.		Distance. Parts.	
° ′			
11.25	S	149.0	S
12.20	S	149.7	S
11.15	S	148.5	S
11.22	S	148.0	S
11. 5	S	150.0	S
Mean = 11.29		Mean = 149.04	
		Z = + 0.21	
		149.25	

Position = 11° 29′ *nf.*

Distance = 47″ 136

1783.66 Position 7° 48′ *nf*; 1783.05. Distance 43″.43 H. Cat. of 1785.

No. VIII. R. A. 0h 38m; Decl. 56° 51′ N.

η Cassiopeiæ; STRUVE 15; III. 3;

Double; very, unequal; large red, small green.

NOV. 12, 1821.

Five-feet Equatorial.

nf.

Position.		Distance. Parts.	
° ′			
8.38	H	28. 3	H
7. 4	H	28. 1	H
8.15	H	29. 0	H
7.55	S	30. 7	S
8. 3	S	30. 0	S
7.50	S	29. 5	S
7.45	S		
Mean = 7.56		Mean = 29.27	
		Z = − 1.44	
		27.83	

Position = 7°.56′ *nf*

Distance = 8″.789

The change, both in position and distance of this remarkable star, has been regularly progressive, as will appear by

the following statement of the measures taken at different periods.

Date.	Position.	Distance.	Observer, &c.
1779.8	———	11″.1	Sir W. HERSCHEL (MSS.
1780.5	———	11 .5	Ditto.
1782.4	29°. 9 *nf*	——	H. Catalogue of 1782.
1803.1	19 .22 *nf*	——	H. "On the changes, &c."
*1814.	16 . 7 *nf*	9 .7	STRUVE, by BESSEL's Obs.
1819.8	9 . 8 *nf*	10 .8	Do. Additamenta, p. 174.
1821.9	7 . 9 *nf*	8 .8	H & S., as above.

The position of 1814 cannot be relied on, being deduced only from two estimations of the ratio of the differences of right ascensions and of declinations to the distance, which differ in their results as much as 8°. If we leave out this doubtful observation, and compute the most probable annual motion from this table by the formula (1) we obtain 0°.5133, which is the angle described per annum in the direction *nfsp*. If we compute back from the last observation as an epoch, with this mean motion, the comparison between the observed and calculated angles will stand as follows:

Date.	Calculated Angles.	Observed Angles.	Difference.
1821. 9	7° .9′ *nf*	7° .9′ *nf*	0°.0′
1819. 8	9 .0	9 .8	+ 0 .8
*{ 1814.08	11 .7	11 .5	— 0 .2
1814.13	11 .7	19 .3	+ 7 .6
1803. 1	17 .6	19 .2	+ 1 .6
1782. 4	28 .2	27 .9	— 0 .3

The observations marked with an asterisk are the two

from whose mean the angle of 1814 was concluded. The second is evidently the erroneous one.

A connection between these stars cannot be doubted, as they have a common proper motion of nearly 2″ per annum. The distance having diminished almost 3″, the apparent orbit is evidently elliptic, but the data at present are not sufficiently precise, and the arc embraced not large enough, to ground any calculation of its position and elements on. The period is probably about 700 years.

No. IX. R. A. $0^h\ 40^m$; Decl. 26° 43′ N.

65, Piscium; STRUVE 16. II. 84;

Double; equal; a very pretty object; 7 and 7 magnitudes

Nov. 13, 1822.

Five-feet Equatorial.

np or *sf*

Position = 25°.48′ *np* or *sf*

Distance = 5″.960

Stars beautifully steady and well defined.

Position.		Distance. Parts.	
90° — 64°.10′	H	20. 2	H
63.58	H	21. 0	H
63.34	H	18. 2	H
65. 0	H	19. 1	H
64 40	H	20. 0	H
64.30	S	19. 0	S
64. 5	S	20. 6	S
63.43	S	19. 5	S
64,22	S	21. 0	S
63.55	S	20. 2	S
Mean = — 64.12		Mean = 19.88	
		Z = — 1.01	
		18.87	

An observation of Sir W. HERSCHEL, on Feb. 27th, 1783, gives 30°.57′ *np* for the position of these stars (2d Catal). A second MS. observation, dated Aug. 13, 1802, assigns 27°. 22′ *np* for the angle. Mr. STRUVE, (Additamenta. 181) "ex

optimâ observatione" Dec. 8, 1819, makes it 26°.51'. Assembling all in one view we have

1783.15	Position 30°.95 *n p* or *s f*	
1802.61	27 .36	
1819.94	26 .85	
1820.92	22 .00	STRUVE, Dorpat, Obs. iii, Obs. 70, p. 133, 2 meas.
1822.86	25 .80	H. and S. ut supra.

The slow decrease in the angle of position is here sufficiently evident, though too small to place any confidence in, were it not for the progressive steps by which the intermediate observations show it to have taken place. The rate of decrease, calculating on all the observations according to the formula (1) is no more than 0°.117 per annum, in the direction *np sf*, or retrograde. Supposing it to revolve uniformly in a circle, its period would at this rate be 3077 years.

The distance, in 1783, was $1\frac{1}{2}$ diameter of the large star. M. STRUVE, in 1819, made it 5".77, with which ours coincides, almost to minute precision. The distance, therefore, as well as the angle, seems to be subject to a slow variation, as a diameter and half between the discs, in equal stars of the 7th magnitude, can hardly exceed 4" from centre to centre.

No. X. R. A. $0^h\ 42^m$; Decl. 67° 51' N. (H. and S.)
Double; equal; 8th magnitude.

Nov. 13, 1822.
Five-feet Equatorial.
sp

Position. ° ′		Distance. Parts.	
56.18	H	9. 0	H
56.30	H	11. 0	H
57.35	H	12. 0	H
54.45	H	13. 0	H
54.30	H	9. 5	H
55.30	S	10. 9	S
54. 0	S	10. 2	S
54.30	S	11. 0	S
54.25	S	11. 5	S
54. 0	S	11. 8	S
Mean = 55.12		Mean = 10.99	
		Z = − 1.01	
		9.98	

Position = 55°.12′ *sp*
Distance = 3".151

No. XI. R.A. $0^h\ 50^m$; Decl. $43°\ 44'$ N.

164 (BODE) Andromedæ; STRUVE 18;

Pretty unequal; 7th and 8th magnitudes.

Nov. 13, 1822.

Five-feet Equatorial.

s p

Position. ° ′		Distance. Parts.	
78.30	H	25. 5	H
77.19	H	22. 8	H
80. 3	H	24. 0	H
78.22	H	26. 1	H
77.14	H	25. 8	H
77.35	H	25. 0	S
80. 0	S	26. 8	S
79. 9	S	24. 8	S
79.56	S	23. 4	S
80. 9	S	25. 0	S
80. 5	S	23. 8	S
Mean = 78.57		Mean = 24.82	
		Z = − 1.01	
		23.81	

Position = $78°.57'$ *sp*

Distance = $7''.520$

No. XII. R. A. $0^h\ 54^m$; Decl. $0°\ 24'$ N.

26 Ceti; STRUVE 20; IV. 83;

Exceedingly unequal; large white, small blue or green; very difficult; will not bear the least illumination.

Nov. 12, 1821.

Five-feet Equatorial.

s p

Position. ° ′		Distance. Parts.	
13.42	H	56 .0	H
16.30	H	47 .0	S
14.45	H	51 .0	S
15.10	H	Mean = 51.33	
13.30	S	Z = − 1.44	
14. 9	S	49.89	
14.45	S		
Mean = 14.39			

Position = $14°.39'$ *s p*

Distance = $15''.756$

The measures of this star, in 1782, were

Position $14°\ 36'$ *s p*. Distance $17''.03$ (mean of 2 Obs.; Second Catalogue), so that it has undergone no material alteration.

M. STRUVE has three observations of this star in 1820 and 1821, the mean of which gives $19°\ 12'$ *sp* for the angle. (Dorpat Obs. iii.)

No. XIII. R. A. $0^h\ 56^m$; Decl. $3°\ 57'$ N.

77 Piscium; STRUVE 25; IV. 68;

Pretty unequal; large white, small bluish, and does not bear illumination so well as its magnitude would lead us to expect. When the field is illuminated they appear considerably unequal.

Nov. 27, 1821.

Five-feet Equatorial.
nf.

Position. ° ′		Distance. Parts.	
7.12	S	101. 2	S
7.34	S	101. 0	S
7.15	S	103. 5	S
7.14	H	102. 8	S
7.10	H	102. 0	S
7.34	H	100. 5	H
		104. 0	H
		101. 4	H
		100. 0	H
Mean = 7.20		Mean = 101.82	
		Z = − 0.28	
		101.54	

Position = $7°.20'$ *nf.*
Distance = $32''.069$.

There seems no reason to suppose a motion in these stars; the observations of Feb. 23, 1783, indeed give

Position $4°\ 48'$ *nf.* Distance $29''.60$. (H. Second Catalogue); but it is remarked, that they were made in weather too windy for accuracy.

1821.44; Position $6°\ 51'$ *nf.* STRUVE; Dorpat Obs. vol. iii. Second Observation.

No. XIV. R. A. 0^h 56′; Decl. 20° 30′ N.

74 ψ Piscium; STRUVE 22; IV. 9;

Double, rather unequal, both white.

Nov. 27, 1821.

Five-feet Equatorial.

sf

Position.		Distance. Parts.	
90°—19° 0′	H	93. 8	S
18. 3	H	93. 9	S
18. 6	H	94. 0	S
18.14	H	92. 0	S
20.10	S	Mean = 93.42	
20. 5	S	Z = −0.28	
20. 0	S	93.14	
19.58	S		
Mean = −19.12			

Position = 70° 48′ *sf*
Distance = 29″.416.

Nov. 13, 1822.

Five-feet equatorial.
Equal
np or *sf*

Position.		Distance.	
90°—18.40	H	99. 0	H
18. 6	H	97. 9	H
18.48	H	96. 0	H
18.30	H	98. 9	H
Mean = −18.31		97. 7	H
		97. 2	H
		99. 0	S
		99. 5	S
		97. 8	S
		97. 0	S
		99. 5	S
		Mean = 98.14	
		Z = −1.01	
		97.13	

Position = 71°.29′ *np* or *sf*
Distance = 30″676

(Stars ill defined.)

Mean result.

Position 71° 2′ *sf*. Distance 30″.34; 1822.38.

This agrees well enough with the measures of 1779 and 1782 (Catalogue of 1782), the *estimated* angle being then 80° *sf*, to obviate any idea of rotation; but the distance seems to have undergone some increase, a measure taken Oct. 30, 1779, making it 27″.5. M. STRUVE has an Observation of the Position of this star, (Dorpat Obs. ii. p. 168. Obs. 183), which he states at 70° 42′ *sf*, differing only 20′ from ours.
1821.94 Position 71° 0′ *sf*. Distance 30″.037 from △ decl. = 28″.40; STRUVE; Dorpat Obs. iii.

No. XV. R. A. $0^h\ 58^m$; Decl. 88° 22′ N.

Polaris; STRUVE 27; IV. 1;

Dec. 23, 1821.

Five-feet Equatorial.

Distance. Parts.	
57. 4	S
59. 8	
58. 5	
57. 6	
58. 2	
59. 7	
56. 2	
57. 2	
57. 6	
57. 9	
58. 2	
56. 5	
56. 5	
56. 9	
Mean = 57.73	
Z = − 0.52	
57.21	

Distance = 18″.068.

July 14, 1822.

Seven-feet Equatorial.

Distance. Parts.	
80. 6	S
84. 3	
80. 7	
85. 5	
78. 6	
82. 8	
78. 9	
79. 3	
78. 0	
80. 3	
81. 8	
79. 3	
Mean = 80.84	
Z = − 0.74	
80.10	

Distance = 19″.259 S.

Distance = 19″.490 R.

Distance. Parts.	
80. 0	Mr. RICHARDSON.
84. 0	
81. 2	
82. 0	
Mean = 81.80	
Z = − 0.74	
81.06	

Polaris continued.

July 20, 1822.

Seven-feet Equatorial.

Distance. Parts.	
80. 0	S
76. 0	S
76. 3	S
79. 3	S
76. 2	S
75. 9	S
80. 3	S
75. 9	S
77. 0	S
80. 7	S
80. 2	S
78. 2	S
82. 0	S
Mean = 78.31	
Z = − 0.44	
77.87	

Distance = 18″.723 S.

Distance = 19″.225 R.

Distance. Parts.	
80°. 3′	Mr. RICHARDSON.
80. 5	Mr. RICHARDSON.
Mean = 80.40	
Z = − 0.44	
79.96	

Feb. 21. 1823.

Seven-feet Equatorial.

s p

Position.	
60°.18′	H
62.22	H
62.18	H
61.14	H
63.44	H
63.23	H
59.14	H
60. 4	H
60.16	H
59.47	H
60.57	S
63.44	S
60.44	S
62.24	S
63.25	S
61.47	S
Mean = 61.36	

Position = 61°.36′ *s p*

Distance = 18″.281

Distance. Parts.	
75. 0	H
72. 5	H
72. 5	H
71. 8	H
70. 6	H
73. 0	H
73. 8	H
74. 5	H
77. 5	H
74. 5	H
78. 8	H
79. 5	H
81. 0	H
77. 3	S
84. 0	S
82. 0	S
83. 0	S
Mean = 76.55	
Z = − 0.52	
76,03	

Polaris continued.

June 18, 1823.

Five-feet Equatorial.

sp.

Position. ° ′		Distance. Parts.	
61.35	H	63. 2	H
61. 0	H	62. 0	H
60.40	H	62. 5	H
60. 0	H	61. 4	H
60.35	H	59. 0	H
Mean = 60.46		Mean = 61.62	
		Z = − 0.36	
		61.26	

Position = 60°. 46′ *sp* } H
Distance = 19″.347 } H

Position. ° ′		Distance. Parts.	
60. 0	S	60. 0	S
60. 0	S	61. 0	S
60.45	S	60. 0	S
60.35	S	62. 3	S
60.50	S	62. 3	S
60.25	S	64. 0	S
Mean = 60.26		Mean = 61.60	
		Z = − 0.36	
		61.24	

Position = 60°. 26′ *sp* } S
Distance = 19″341 } S

Aug. 7, 1823.

Five-feet Equatorial.

Distance.
Parts

57. 8 } S
62. 5
60. 2
56. 3
61. 9
63. 2
61. 3

Mean = 60.46
Z = − 1.76

58.70

Distance = 18″.539.
Measures by no means satisfactory.

Aug. 9, 1823.

Seven-feet Equatorial.

Distance.
Parts.

80. 4 } S
81. 2
80. 2
78. 9
79. 8
81. 3
78. 2
81. 5
79. 3
77. 0

Mean = 79.78
Z = − 1.44

78.34

Distance = 18″.836.
Star not sharply defined, but measures taken with the greatest care.

Aug. 12, 1823.

Five-feet Equatorial.

Distance.
Parts.

62. 5 } H
63. 8
60. 0
60. 2
60. 6
58. 5
63. 0
59. 5
58. 2
59. 6

Mean = 60.59
Z = − 2.16

58.43

Distance = 18.″453.
Measures unsatisfactory.

Polaris continued.

Mean result.

Position 61° 11′ *sp*. *Distance* 18″.701. *Epoch* 1823.06.

The positions agree very well. The distances are difficult to take, from the great inequality of the stars; but the mean here set down being the result of not less than 100 measures, is certainly very near the truth.

Other measures of this star are

	Position.	Distance.	
1781.50.	67°. 2′. *sp*	18″.468;	H. means of measures in the years 1779, 1781, 1782.
1802.17.	61°.43′. *sp*		H. MSS. Observation.
1815.	60°. 2′. *sp*	18″. 50;	STRUVE Addit. p. 182.
1819.	60°. 6′. *sp*	18″. 05;	ditto, ditto.
1821.80		18.″ 26;	Dorpat Obs. iii. p. 139. Obs. 21, 33.

The observations of stars very near the pole require a correction to reduce them from one date to another, by reason of the motion of the pole in the heavens due to precession, which alters more or less rapidly their angle of position. In Polaris, the annual variation of the angle (being *sp*) is — 195″= — 3′ 15″. Hence the correction for 42 years is — 2° 16′, which, applied to the measure of 1781.50, reduces it to 64° 46′ *sp*. The observation of 1802 similarly treated, becomes 60° 38′, coinciding very well with the present angle. A correction similar in principle, will of course be required for all the stars, after the lapse of long periods; and the only way to obviate the necessity of using it, would be to refer all the angles to the ecliptic, and its parallels; but we are at present very far from the necessity of a reduction requiring so much labour.

No. XVI. R. A. $1^h\ 4^m$; Decl. 6° 37′ N.

ζ Piscium; STRUVE 32; IV. 8;

Double; rather unequal; L white, S bluish.

Nov. 23, 1821.

Five-feet Equatorial.

nf

Position.	Distance. Parts.
° ′	
25.17	80. 2
26.43	76. 0
26.30	79. 4
26.17	80. 3
26.56	77. 0
25.18	80. 6
27.22	
H	H
Mean = 26.20	Mean = 78.92
	Z = − 0.28
	78.64

Position = 26°.20′ *nf*

Distance = 24″.836

Dec. 16, 1821.

Five-feet Equatorial.

nf

Position.	Distance. Parts.
° ′	
26. 3	78. 5
26.58	78. 8
26.45	76. 6
26.28	78. 1
27. 5	77. 0
27.12	78. 8
26.44	77. 1
	78. 0
S	S
Mean = 26.45	Mean = 77.86
	Z = − 0.26
	77.60

Position = 26°.45′ *nf*

Distance = 24″.507

Mean result.

Position 26°.33′ *nf*; Distance 24″.648; 1821.92.

There is no reason to apprehend any material alteration in this star, Sir WILLIAM HERSCHEL's measures being, Position 22°.37′ *nf* (1781, Nov. 19); Distance 22″.187 (1780) "not very exact."

This star has also been measured by M. STRUVE, who makes its position 26°.36′ *nf* (Dorpat. Observations, ii. p. 167, Obs. 139.) Subsequent measures, by the same eminent observer, make it 25°.36′ *nf*. Dorpat Obs. iii. p. 134, Obs. 95.

No. XVII. R. A. $1^h\ 5^m$; Decl. 8° 45′ S.
37 Ceti; STRUVE 34; V. 24;
7 and $8\frac{1}{2}$ magnitudes.

Oct. 16, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.
° ° ′		
90—27.12 S		163. 5 S
28. 5 S		162. 3 S
27.16 S	Position = 62°.27′ *np*	158. 0 S
27.52 S	Distance = 50″,780	160. 5 S
27.20 S		158. 6 S
Mean = —27.33		Mean = 160.58
		Z = + 0.21
		160.79

Other measures are,

1783.65; Position 62° 36′ *np*; Distance 45″.15; H. Cat. of 1785.

1821.95; Position 64° 0′ *np*; Distance 48″.320 :: STRUVE; Dorpat Obs. iii. p. 144. Obs. 132. from △ declin. = 43″.43, which however is marked as a suspicious observation.

No. XVIII. R. A. $1^h\ 13^m$; Decl. 67° 11′ N.
ψ Cassiopeiæ; STRUVE 38; V. 83;
Double; very unequal; L red; S dusky.

Nov. 25, 1822.
Five-feet Equatorial.
sf

Position.		Distance. Parts.
° ° ′		
90—78.30 H		107. 0 H
79.31 H		111. 0 H
78.40 H		107. 7 H
77. 0 H		109. 5 H
79.20 H		106. 5 H
78.30 S		108. 0 S
78.55 S	Position = 11°.13′ *sf*	106. 0 S
79.10 S	Distance = 33″904	107. 0 S
78.50 S		105. 7 S
79.20 S		104. 5 S
Mean = —78.47		Mean = 107.29
		Z = + 0.06
		107.35

ψ Cassiopeiæ continued.

Nov. 25, 1822.

Seven-feet Equatorial.

sf

Position.		Distance. Parts.	
° ′			
90—79.48	H	133. 0	H
78. 0		131. 2	
78.18		135. 0	
78.15		137. 0	
78.10		133. 8	
Mean = —78.30		Mean = 134.00	
		Z = + 0.06	
		134.06	

Position = 11°.30′ *sf*
Distance = 32.″233

Mean result.

Position 11° 19′ *sf*; Distance 33″.347; 1822.90.

In 1783, the measures were as follows:

Position 10° 12′ *sf*; Distance 33″.41. (Catalogue of 1785); so that this star has undergone no sensible alteration.

No. XIX. R. A. $1^h\ 25^m$; Decl. 11° 38′ N.

100 Piscium; STRUVE 42; IV. 131;

Considerably unequal; a miniature of 77 Piscium; is a faint object; and the measures, especially of distance, are in consequence difficult.

Nov. 27, 1821.

Five-feet Equatorial.

nf

Position.		Distance Parts.	
° ′			
9.21	H	50. 0	H
9.30		51. 0	
10.35		53. 0	
10.38		52. 0	
9.28	S	49. 1	S
9. 5		50. 5	
9. 0		51. 2	
9. 5		51. 2	
Mean = 9.35		Mean = 51.00	
		Z = — 0.28	
		50.72	

Position = 9°.35′ *nf*
Distance = 16″.018

No material change in this star. In the Catalogue of 1785, the measures stand as follows:

Position 5° 0′ *nf*; Distance 15″.88; 1783, Aug. 2.

1821.44; Position 10° 14′ *nf*; STRUVE; Dorpat Obs. iii. p. 134, 142.

No. XX. R. A. $1^h\ 44^m$; Decl. $18^\circ\ 25'$ N.

γ Arietis; STRUVE 47; III. 9;

Nov. 27, 1821.

Five-feet Equatorial.

np or *sf*

Position $= 89^\circ.23'$ *np* or *sf*
Distance $= 9''.995$.

Position. ° ′		Distance. Parts.	
90—0.35	S	32. 7	S
0.32	S	31. 0	S
0.31	S	31. 8	S
0.58	H	32. 1	H
0.14	H	32. 6	H
0.53	H	31. 4	H
Mean = — 0.37		Mean = 31.93	
		Z = — 0.28	
		31.65	

Equal; both bluish, improved by illumination. Magnitudes 5 and 5.

Nov. 18, 1822.

Five-feet Equatorial.

np or *sf*

Position $= 88^\circ.51'$. *np* or *sf*
Distance $= 8''.931$

A third Star in view.

Position. ° ′		Distance. Parts.	
90—0.32	H	28. 8	S
0.18	H	28. 6	S
1.29	H	27. 2	S
1.35	H	30. 3	S
1.22	H	29. 1	S
1.59	S	29. 2	H
1.10	S	30. 5	H
1.15	S	27. 2	H
0.50	S	29. 1	H
0.59	S	30. 0	H
		31. 0	H
Mean = — 1. 9		Mean = 29.18	
		Z = — 0.90	
		28.28	

Nov. 13, 1823.

Seven-feet Equatorial.

Equal 5th and 5th Mag.

np or *sf*

Position $= 88^\circ.6'$ *np* or *sf*
Distance $= 8''.774$

Probably the northern star is the smaller.

Position. ° ° ′		Distance. Parts.	
90—2.10	H	38. 0	H
2.30	H	41. 5	H
1. 0	H	39. 4	H
2.32	H	38. 4	H
3.10	H	40. 6	H
2. 3	S	42. 5	S
1.25	S	41. 7	S
1.14	S	41. 2	S
1. 0	S	41. 0	S
1.54	S	40. 7	S
Mean = — 1.54		Mean = 40.50	
		Z = — 4.01	
		36.49	

A distant star C in the field.

No. XXI.

Position.	Nov. 13, 1823.	Distance. Parts.
° ′		
5. 0 } S	Measures of AC.	955. 0 } S
5. 5 } S	Seven-feet Equatorial.	955. 7 } S
4.30 } H	5th and 9th Mag.	956. 1 } H
4.30 } H	*n f*	952. 8 } H
		957. 6 } H
Mean = 4.46	Position = 4°.46′ *n f*	Mean = 955.44
	Distance = 3′.48″.764	Z = − 4.01
		951.43

			Distance.	Epoch.
Mean position	AB;	88° 41′ *np* or *sf*;	9″.109;	1822.88
	AC;	4.46 *nf*;	3′48″.764;	1823.86

Other measures of this Star are

1756.00; Position 78° 46′ *sf*; MAYER. Computed from differences of R. A. and Decl.

1779.80; ——— 84 0 ; H. Account of changes, &c.

1780.80; ——— 86 5 *np*; Distance 10″.172 (9 measures) H. Catal. of 1782.

1802.20; ——— 89 10 ; ——— H. Account of changes, &c.

1816.81; ——— 87 27 *sf*; ——— HERSCHEL, jun. The position is undoubtedly *sf*.

1819.88; ——— 84 3 *sf*; ——— STRUVE, (2 meas) Additam. 182.

1821.90; ——— 86 54 *np* or *sf*; 9.″123 ——— STRUVE, Dorp. iii. pages 141, 142, 144, from △ decl. = 9″.11.

The change therefore in the angle of position, surmised by Sir W. HERSCHEL in his Account of Changes, &c. is not confirmed. Indeed it was chiefly concluded by him from the angle deduced from MAYER's observations, which of course must be very precarious. On the other hand, the distance seems to be subject to a trifling decrease, though perhaps the circumstance of the diameters of the two stars being included in the measures of 1780, may account for the excess in those observations.

No. XXII. R. A. $1^h\ 47^m$; Decl. 76° 25′ N.

47 Cassiopeiæ; STRUVE 49; (*)

Double; extremely unequal; large white, small blue; magnitudes 4 and 10; very difficult.

Dec. 21, 1821.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.	
78. 0	H	299. 0	H
76.36	H	297. 0	H
79.31	H	296. 5	S
77.55	H	295. 0	S
76. 5	S		
78. 0	S		
Mean = 77.41		Mean = 296.87	
		Z = — 0.52	
		296.35	

Position = 77°.41′ *sp*
Distance = 1′.33.″594

No. XXIII. R. A. $1^h\ 48^m$; Decl. 22° 43′ N.

λ Arietis; STRUVE 50; V. 12;

Large white; small blue, pretty unequal.

Nov. 29, 1821.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
44.33	H	117. 2	H
42.55	H	121. 0	H
43.33	H	118. 9	H
44.50	H	120. 3	H
44.28	H	119. 5	H
43. 5	S	121. 8	S
44.58	S	121. 5	S
44.50	S	121. 8	S
45.30	S		
44.32	S		
Mean = 44.19		Mean = 120.25	
		Z = — 0.28	
		119.97	

Position = 44°.19′ *nf*
Distance = 37″.889

According to Sir W. HERSCHEL (Catalogue of 1782), the measures of this star are

Position 42° 0′ *nf*; Distance 36″.61; 1781.83.

Mr. STRUVE has also measured this star (Dorpat Obs. ii. page 167. Obs. 145), and states the position at 43° 42′ *nf*, (mean of 3 observations). A subsequent measure (Dorpat Obs. iii. p. 134) makes it 45° 1′ *nf*; mean 44° 21′ *nf*; Epoch 1820.39.

* Entered in STRUVE's and SOUTH's Catalogues as V. 84. In the Catalogue of 1785, V. 84, is called Fl. 47 : : Cassiopeiæ, but is evidently a different star.

No. XXIV. R. A. $1^h\,51^m$; Decl. 23° 48′ S

292 (BODE) Ceti; STRUVE 51; II. 58?

Double; unequal; 8th and 9th magnitudes.

Nov. 23, 1822.

Five-feet Equatorial.

np

Position. ° ° ′		Distance. Parts.	
90—51.36	H	29. 7	S
53.45	H	30. 2	S
54.30	H	30. 8	S
54.45	H	30. 3	S
52.34	H	30. 8	S
50.30	S	28. 7	H
53.35	S	25. 1	H
55. 0	S	27. 8	H
54. 0	S	26. 2	H
54.50	S	29. 9	H
Mean = — 53.30		Mean = 28.95	
		Z = — 0.20	
		28.75	

Position = 36°.30′ *np*

Distance = 9″.080

If this be the same star with II. 58, it must have sustained considerable alteration, both in angle and distance; as in 1783, its position was 25° 12′ *np*, and the distance sufficiently small to be estimated at $1\frac{1}{2}$ diameter of the large star. This may raise a doubt as to its identity, though both BODE and STRUVE agree in making it the same. The star, however, should be watched.

No. XXV. R. A. $1^h\,53^m$; Decl. 1° 53′ N.

α Piscium; STRUVE 53; II. 12;

A beautiful double star; nearly equal.

Nov. 23, 1821.

Five-feet Equatorial.

np

Position. ° ° ′		Distance. Parts.	
90—24.57	H	17. 2	H
24.50	H	16. 8	H
23.40	H	17. 0	H
24.41	H	17. 4	H
23. 0	H	18. 5	H
Mean = — 24.14		Mean = 17.38	
		Z = — 0.28	
		17.10	

Position = 65°.46′ *np*

Distance = 5″.401

α Piscium continued.

Position.	Dec. 16, 1821.	Distance. Parts.
$90^\circ - 24^\circ.39'$	Five-feet Equatorial.	16. 0
24.35	*n p*	18. 0
25. 4 S		18. 5
24.49		17. 6 S
24.23	Position $= 65^\circ.23'$ *np*	16. 5
24.15	Distance $= 5''.448$	17. 8
		18. 2
Mean = — 24.37		Mean = 17.51
		Z = — 0.26
		17.25

Mean result.

Position $65^\circ\ 33'$ *np*; Distance $5''.428$; 1821.93

That this star has undergone no appreciable change, the following statement of earlier observations will show.

Position.

$67^\circ\ 23'$ *np*;	H. First Catalogue.	1781.79
63 0 *np*;	Ditto Account of changes, &c.	1802.08
70 48 *np*;	STRUVE, Additamenta, p. 182	1819 .9

Distance.

$5''.123$. HERSCHEL. 1st Catalogue. 1781.79

The mean of the angles of 1781 and 1802, agrees closely with our own. M. STRUVE'S is doubtless too large.

No. XXVI. R. A. $1^h\ 53^m$; Decl. $41°\ 28'$ N.

γ Andromedæ; Struve 54; III. 5;

Large orange; small emerald green; very beautiful.

Position.		Nov. 29, 1821. Five-feet Equatorial. *nf*	Distance. Parts.	
° ′				
23.37	H		35. 0	H
27. 4	H		36. 1	H
26.18	H		35. 1	H
26.12	H		34. 8	H
25.34	H		33. 0	H
25.52	S	Position = 25°.14′ *nf*	35. 7	H
24.14	S	Distance = 10″.909	34. 2	S
23.42	S		36. 0	S
24. 1	S		33. 4	S
25.55	H		34. 9	S
Mean = 25.14			Mean = 34.82	
			Z = – – 0.28	
			34.54	

The following is an arranged statement of the measures of this star, taken at various times, and by different observers.

Position.

19° 37′ *nf*;	Herschel. First Catalogue	1781.8
26 46 *nf*;	mean of 3 meas. in 1802,3,4, "Account of Changes, &c."	1803.1
28 12 *nf*:	Herschel, Jun.	1816.85
25 35 *nf*;	Struve, Additamenta	1819.9
25 14 *nf*:	Herschel and South	1821.91

Distance.

9″.254	H. First Catalogue	1781.0
10 .480	Struve, Additamenta	1819.9
10 .909	H. and S. as above	1821.91

M. Struve's remark, that the angle of 1781 must be given up, is probably correct; the measure, however, is regularly entered in the Journal of that year, and correctly cast up. This granted, the position appears to be subject to no material alteration, and the distance only to a very trifling, if any increase.

No. XXVII. R. A. $2^h\ 0^m$; Decl. $38°\ 11'$ N.

59 Andromedæ; 59 STRUVE; IV. 129;

A little unequal; both bluish.

Nov. 29, 1821.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
58.32	S	55. 5	S
58.24	S	55. 2	S
59.10	S	58. 0	S
54.10	H	56. 7	S
55.50	H	57. 1	S
55.18	H	58. 4	H
54. 3	H	56. 0	H
56.30	H	56. 6	H
56. 0	H	55. 0	H
59. 3	S	56. 5	H
56. 0	S	Mean = 56.50	
58.29	S	Z = − 0.28	
59.28	S	56.22	
58.37	S		
Mean = 57. 7			

Position $= 57°.7'$ *nf*

Distance $= 17''.755$

Dec. 6, 1821.

Five-feet Equatorial.

nf

Position. ° ′	
54.36	H
54.12	H
55.30	H
56.17	H
57.30	H
57.47	S
58. 5	S
56.55	S
Mean = 56.21	

Position $= 56°.21'$ *nf*

When position wire set purposely to 59°.10′, the angle declared positively too large (S. and H.)

Dec. 8, 1821.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
54.43	H	52. 5	H
53.20	H	52. 0	H
55. 0	H	52. 4	H
Mean = 54.21		55. 0	H
		Mean = 52.97	
		Z = − 0.09	
		52.88	

Position $= 54°.21'$ *nf*

Distance $= 16''.701$

59 Andromedæ continued.

Position.	Feb. 1, 1822.	Distance. Parts.
° ′	*nf*	
53.52	Five-feeet Equatorial.	54. 3
53.58		53. 0
53.41 S		53. 2 S
54. 0	Position $= 53°.49$ *nf*	52. 0
53.36		54. 0
	Distance $= 16''.464$	53. 4
Mean = 53.49		Mean = 53.32
		Z = − 1.19
		52.13

Mean Result.

$56° \, 5'$ *nf*; Distance $= 17''.157$; 1822.0.

The measures of 1783.48, recorded in the Catalogue of 1785, give

Position $55° \, 9'$ *nf*; Distance $15''.25$.

The angle therefore seems liable to no alteration, but the distance is increased if the measure of 1783 be correct; but it is only the result of a single measure.

This star is remarkable for the great differences between the means of several independent sets of measures, while the star presents no peculiar difficulty. One of the angles differs $3° \, 23'$ from the mean of all; and this may be considered the maximum error to which the measure of an angle can be considered liable, unless in peculiar cases.

No. XXVIII. R. A. $2^h\ 2^m$; Decl. $29^\circ\ 27'$ N.

ι Trianguli. FL. 6; STRUVE 61; II. 34;

Close; considerably unequal; very beautiful. Sir W. H. compares it to α Herculis, and the comparison is just. It bears illumination very well.

Dec. 10, 1821.

Five-feet Equatorial.

nf

Position.		Distance. Parts.	
13°. 6′	H	11. 7	H
12.14	H	13. 0	H
11. 1	H	11. 3	H
11.45	H	11. 9	H
12.10	S	12. 2	H
11.43	S	13. 4	S
12.16	S	12. 0	S
		11. 7	S
		12. 6	S
		13. 3	S
Mean = 12. 2		Mean = 12.31	
		Z = − 0.02	
		12.29	

Position $= 12^\circ\ 2'$ *nf*

Distance $= 3''\ 881$

The measures in the catalogue of 1782 are as follows:

Position $4^\circ\ 23'$ *nf*; Distance $1\frac{1}{2}$ diameter of L. 1781.77.

There can hardly then be a doubt of a change of position in this star, as the measure of 1781, though only a single one, could hardly err 8°, especially so near the parallel. The distance remains as it was.

No. XXIX. R. A. $2^h\ 3^m$; Decl. $3°\ 17'$ S.

66 Ceti; Struve 62; IV. 25;

Double; pretty unequal; 7 and 8 magnitudes, H and S; (6 and 9 Struve.)

Nov. 23, 1822.

Five-feet Equatorial.

s p

Position. ° ′		Distance. Parts.	
46.45	H	53. 5	S
45.14	H	54. 1	S
45.20	H	52. 3	S
45.34	H	53. 5	S
45.10	H	48. 5	H
43. 0	S	49. 2	H
42. 3	S	49. 0	H
42.35	S	50. 0	H
42. 0	S	48. 9	H
41.30	S	52. 0	S
		4 · 5	S
Mean = 43.55		Mean = 51.41	
		Z = − 0.20	
		51.21	

Position $= 43°.55'$ *s p*
Distance $= 16''.173$

The following is the comparison of our results with those of other observers:

Position.

30° or 35° *s p*;	MSS. Journal Sir W. H.	1783.00
38°.40′ *s p*;	Struve, Additamenta, &c.	1819.
44°. 1′ *s p*;	do. Dorpat Obs. iii. p. 134. Obs. 80 and 99; 6 measures.	1820.98

Distance.

16″.875	Herschel, First Catalogue	1783.00
16 .150	Struve, Additamenta, p. 176	1819.

The distances agree perfectly, but there is something unsatisfactory about all the angles, the mean of Mr. Herschel's observations being 45° 37′, and of Mr. South's 42° 14′, while the coincidence of each set with itself, indicates an evident bias in the judgment of one or both of the observers, from some casual cause. The magnitudes too disagree with those of M. Struve, as well as the position.

No. XXX. R. A. $2^h\ 4^m$; Decl. 29° 34′ N.

Anonyma; STRUVE 63; Hist. Cel. 124.

Double; almost equal; very close; exactly equal; magnitudes 7 and 7.

Dec. 11, 1821.

Five-feet Equatorial.

sp or *nf*

Position.		Distance. Parts.	
° ′			
20.24	H	19. 5	H
21.30	H	18. 0	H
22.23	H	19. 2	H
23. 0	H	18. 8	S
24.12	S	20. 9	S
23.58	S	19. 0	S
23.37	S	Mean = 19.23	
23.35	S	Z = − 0.02	
Mean = 22.50		19.21	

Position = 22°.50 *sp* or *nf*

Distance = 6″.067

No. XXXI. 10, *a*, Trianguli; R. A. $2^h\ 8^m$; Decl. 27° 49′ N.

Near 10 Trianguli; STRUVE 67; IV. 40; R. A. $2^h\ 7^m$; Decl. 27 54′ N.

Pretty unequal.

Dec. 15, 1821.

Five-feet Equatorial.

sp

Position.		Distance. Parts,	
° ′			
61.51	S	45. 1	S
61.24	S	45. 4	S
60.56	S	45. 9	S
60.45	S	45. 6	H
60. 5	H	45. 0	H
61. 9	H	45. 3	H
61.18	H	Mean = 45.38	
Mean = 61. 4		Z = + 0.05	
		45.43	

Position = 61° 4′ *sp*

Distance = 14″.347

There is some confusion between the two stars whose places are set down at the head of this observation, and unfortunately, the previous observations only tend to increase it. The star here observed was found by setting the equatorial to the place of 10 Trianguli. STRUVE, (Dorpat Obs. ii. 167, Obs. 144), makes 10 Trianguli a double star, but gives

its position 24° 12′ *sp*, and calls the stars 8 and 7.8 magnitudes. The star IV. 40, is called simply Fl. 10 Trianguli (*a*) in the Catalogue of 1782; but in the MSS. Journal for that year we find this remark, "My IV. 40, is near 10. It is the "preceding telescopic star of a small triangle, whereof the largest is 10 Trianguli." The distance of IV. 40, in 1781, was 17″.317. So that if this be the star, its distance must have decreased considerably. But when every circumstance is equivocal, it is useless to conjecture.

No. XXXII. R. A. $2^h\ 26^m$; Decl. 23° 52′ N.

30 Arietis; Struve 75; V 49;

Double; slightly unequal.

Dec. 6, 1821.

Five-feet Equatorial.

n p

Position. ° ° ′		Distance. Parts.	
90—87.50	S	122. 8	S
87.36	S	122. 0	S
87.45	S	118. 0	S
87.40	S	120. 1	S
87.55	H	120. 5	S
87. 3	H	119. 8	S
87.41	H	123. 1	H
87.37	H		
Mean = — 87.38		Mean = 120. 9	
		Z = — 0.28	
		120.62	

Position = 2°.22′ *n p*
Distance = 38″.093

Dec. 8, 1821.

Five-feet Equatorial.

n p

Position. ° ° ′		Distance. Parts.	
90—87. 0	H	124. 5	H
		124. 3	H
		122. 3	H
		122. 0	H
		123. 8	H
		Mean = 123.38	
		Z = — 0.09	
		123.29	

Position = 3°.0′ *n p*
Distance = 38″.937

Mean result.

Position 2° 26′ *n p*; Distance 38″.445. 1821.99.

Distance according to other observers.

31″.734	HERSCHEL, First Catalogue;	1781.79
34 .200	Ditto, MSS. Journal, central measure;	1782.98
38 .260	STRUVE, Additamenta, p. 183;	1819.

There can be little doubt of a considerable change of distance between these stars. The agreement between our measure and that of M. STRUVE is satisfactory, the latter being deduced from differences of R. A. observed with the transit, which, when the position is so near the parallel, is a very exact method.

No. XXXIII. R. A. 2^h 30′; Decl. 26° 17′ N.

33 Arietis; STRUVE 77; IV. 5;

Double; excessively unequal.

Jan. 28, 1822.

Five-feet Equatorial.

nf

Position.	
° ′	
89. 0	H
88. 2	H
91. 5	H
Mean = 89.22	

Position = 89°.22′ *nf*

S. could not see the small star, night became so unfavourable.

Feb. 1, 1822.

Five-feet Equatorial.

Double; considerably unequal; large white, small blue.

The small star does not bear a good illumination.

nf

Position.		Distance. Parts.	
° ′			
87.36	S	92. 5	S
87.50	S	93. 8	S
87.42	S	93. 3	S
87.41	S	94. 3	S
87.45	S	94. 1	S
Mean = 87.43		Mean = 93.60	
		Z = − 1.19	
		92.41	

Position = 87°.43′ *nf*

Distance = 29″.185

Mean result.

Position 88° 20′ *nf*; Distance 29″.185, 1822.

The distance seems to have increased somewhat, but the angle to have undergone no material change since 1781.79, when the measures (as stated in the Catalogue of 1782) were

Position 87° 14′; Distance 25″.533, (inaccurate.)

No. XXXIV. R. A. 2^h 38^m; Decl. 55° 8′ N.

η Persei; STRUVE 81; IV. 4;

Double; extremely unequal; large red, small dusky bluish; the small star, although exceedingly faint, bears a good illumination. The colours are decided.

Nov. 23, 1821.

Five-feet Equatorial.

Position. ° ° ′		*n p*	Distance. Parts.	
90—60. 7	H	Position = 30°.53′ *n p*	90. 0	H
58. 9		Distance = 29″.566	93. 5	
57.33			95. 0	
60. 0			96. 0	
59.44			95. 0	
Mean = —59. 7			Mean = 93.90	
			Z = — 0.28	
			93.62	

Dec. 16, 1821.

Five-feet Equatorial.

Position. ° ° ′		*n p*	Distance. Parts.	
90—60.30	S	Position = 29°.1′ *n p*	94. 0	S
59.35		Distance = 29″.195	92. 8	
61.30			92. 0	
61.32			92. 9	
61.30			92. 5	
61.18			92. 0	
Mean = —60.59			Mean = 92.70	
			Z = — 0.26	
			92.44	

η Persei continued.

Nearly in a line with the above, and about the same magnitude as the smaller, at some distance is another star.

Position = 24°.24′ *n p*. (2 measures, S.)

Dec. 21, 1821.

Five-feet Equatorial.

n p

Position.		Distance. Parts.
° ° ′		
90—60. 0 } H	Position = 29°.56′ *n p*	87. 8 } H
58.36	Distance = 28″.325	91. 3
61. 1		87. 2
60.33		92. 4
60.10		91. 9
		91. 5
		89. 4
Mean = — 60. 4		Mean = 90.21
		Z = — 0.52
		89.69

Measure of the distant star.

Position = 25°.13′ *n p*. (2 measures H.) Distance = 3′57″.175 (2 measures H. and S.)

η Persei; Mean result.

	Position.	Distance.	
	29° 53′ *n p*;	28″.959;	1821.94
(Comes)	24 48 *n p*;	3′.57″.175;	1821.97

Measures by other observers.

	20 5 *n p*	HERSCHEL, 1st. Catalogue	1781.97
	29 9 *n p*	STRUVE, Additamenta 183	1819.79
Distance	26″.000	HERSCHEL, 1st Cat. very inaccurate	1780.58
	28 .500	STRUVE, Additamenta 183	1819.

The angle is decidedly on the increase at the rate of about 0°.25 per annum, in the direction *s p n f*. The distance too is perhaps undergoing a slight increase.

No. XXXV. R. A. $2^h\ 39^m$; Decl. $16°\ 42'$ N.

π Arietis; STRUVE 82; I. 64;

Dec. 11, 1821.

Five-feet Equatorial.

sf

Position.			Distance. Parts.	
$90°-56°.46'$	H		8. 5	H
57.35	H		9. 6	H
56. 5	H		10. 5	H
55.42	S	Position $= 32°.29'$ *sf*	11. 0	S
56.16	S	Distance $= 3''.076$	9. 5	S
56.42	S		10. 0	S
			9. 2	S
Mean $= -$ 56.31			Mean $=$ 9.76	
			Z $= -$ 0.02	
			9.74	

Dec. 17, 1821.

The second small star not seen either with the five-feet equatorial or transit instrument. The evening very fine, and much attention bestowed. The field of each instrument perfectly dark. The object glass of the transit made for me by Mr. TROUGHTON is full four inches in diameter, and its focal length rather more than seven feet. (S.)

Dec. 23, 1821.

Looked for the small star which Sir W. HERSCHEL describes as 25 or 26 seconds distant from the large one, and which was at the time of his observations in a line with it and the small close one. With the five feet S. thought he got a glimpse of it when powers 303 and 381 were employed. A small distant star was seen, whose angle of position with the large star was about 47° *sf*. Night tolerably good.

Other measures of this star are

Position 19° 9′ *sf*	Catalogue of 1782.	1782.77
34 11 *sf*	Account of changes, &c.	1802.80
31 15 *sf*	Account of changes, &c.	1804.10

1821.95; Position 30° 0′ *sf*; STRUVE, Dorpat Obs. iii. p. 143.

The change of position in the interval between 1782 and 1802 is therefore not verified, and has probably arisen from some error in the earlier observation. The loss or disappearance of the third star, described as in a line with the other two, and 25 or 26″ distant, is therefore to be regretted, and is the more singular, as a MSS observation (Journal. Dec. 23, 1782) describes it as "easier to be perceived" than the nearer one.

Slough, 10 feet reflector, Aug. 5, 1823, (H.)

π Arietis triple, 1 and 2 excessively close and extremely unequal; estimated distance 2″, 1 and 3 extremely unequal, considerably distant, perhaps 20″, both *sf.* No one certainly would now say the three stars are in a line, or nearly in a line, unless speaking very loosely. The small stars include an angle of 15° or 20° at the large one. The line joining 1 and 2 points exactly to a faint star at 2 or 3 minutes distance in the *sf* direction. The constellation is very low, yet both stars are very distinct, but the farther certainly more so.

No. XXXVI. R. A. $2^h\ 39^m$; Decl. $26^\circ\ 31'$ N.

41 Arietis; STRUVE 83; VI. 5? (*);

Double extremely, or excessively unequal; large white; small dusky. The measures, especially those of distance, are attended with extreme difficulty.

Dec. 15, 1821.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.	
45.54	H	411. 0	H
42.30		403. 0	
41.31		405. 2	
43.53		401. 8	S
41.26		398. 5	
43.10		401. 7	
43.50	S	399. 2	H
43.30		406. 0	
43.51		408. 2	
44.22			
Mean = 43.24		Mean = 403.84	
		Z = + 0.05	
		403.89	

Position = $43^\circ.24'$ *sp*
Distance = $2'.\ 7''.557$

The distance is stated by Sir W. HERSCHEL in his first Catalogue at $125''.587$, differing very little from ours, when the difficulty of the measure is considered.

No. XXXVII. R. A. $2^h\ 59^m$; Decl. $6^\circ\ 46'$ N.

499 (BODE) Ceti; STRUVE 89;

Double; pretty unequal; both very faint.

Nov. 27, 1821.

Five-feet Equatorial.

sf

Position. ° ° ′		Distance. Parts.	
90—16.40	H	258. 0	H
15.37		259. 5	
16.48		258. 4	
16.51	S	257. 5	
16.53		256. 4	S
16.40		256. 4	
		258. 0	
		257. 0	
Mean = − 16.35		Mean = 257.65	
		Z = − 0.28	
		257.37	

Position = $73^\circ.25$ *sf*
Distance = $1'.21''.283$

1821.95 Position $73^\circ\ 12'$ *sf*; Distance $1'\ 21''.362$; STRUVE, Dorpat Obs. iii. p. 144, from $\triangle$ declin. $= 1'\ 17''.89$.

* In the printed paper (Phil. Trans. 1782) it is called by mistake 35 Arietis; 35 however is a single star.

No. XXXVIII. R. A. $3^h\ 45^m$; Decl. $3°\ 30'$ S.

32 Eridani; STRUVE 3; II. 36;

Double; pretty unequal; large straw colour, small blue.

Position.	Nov. 23. 1821.	Distance. Parts.
° ° ′	Five-feet Equatorial.	
90— 9.20 } S	*n p*	27. 3 } S
9.45		26. 0
9.40		26. 5
11. 0 } H		25. 0
12.13		26. 5 } H
11.30	Position = 79°.1′ *n p*	25. 0
11.33	Distance = 8″.081	24. 7
12.55		26. 0
Mean = —10.59		Mean = 25.87
		Z = — 0.28
		25.59

Other measures of this star are,

Position	73° 23′ *np*;	HERSCHEL, 1st Catalogue	1781.81
	77 19 *np*;	Do. "Account of changes"	1804.11
	80 36 *np*;	STRUVE, Dorpat Obs. iii. p. 144	1821.47
Distance	4″32;	HERSCHEL, 1st Catalogue	1781.81
	5 79;	Do. MSS. single measure	1783.08
	5 04;	Mean of the above	1782.44
	6 984;	from Δ decl. = 6″.89; STRUVE, Dorpat Obs. iii. p. 144;	1821.95

The change which appears to have taken place in the angle may, perhaps, be only illusory; but it can hardly be doubted that a considerable increase of distance, to the extent of at least 2″, has taken place. The difference of a whole second between our measure and M. STRUVE'S, in a star so favourable to measures of distance, is more than should be expected.

No. XXXIX. R. A. $3^h\ 46^m$; Decl. $39°\ 29'$ N.

ε Persei; STRUVE 112; II. 22;

Extremely unequal; large white; small bluish; beautifully defined; and stars very steady.

Dec. 8, 1821.

Five-feet Equatorial.

nf

Position.		Distance. Parts.	
° ′			
79.15	H	27. 1	H
79.54	H	25. 5	H
80.55	H	27. 6	H
82.10	H	27. 8	H
79.13	H		
Mean = 80.17		Mean = 27.00	
		Z = − 0.09	
		26.91	

Position = 80° 17′ *nf*
Distance = 8″ 498.

Dec. 16, 1821.

Five-feet Equatorial.

nf

Position.		Distance. Parts.	
° ′			
78. 6	S	26. 9	S
79.40	S	27. 9	S
79.12	S	28. 1	S
79.29	S	28. 0	S
79. 7	S	27. 5	S
78.52	S		
79.21	S		
Mean = 79. 7		Mean = 27.68	
		Z = − 0.26	
		27.42	

Position = 79° 7′ *nf*
Distance = 8″.659.

South following and distant is a small star which bears illumination rather better than the closer one; when the field is dark it also seems brighter.

Position = 54°.0′ *sf* (2 measures, S.)

Mean result.

Position 79° 38′ *nf*; Distance 8″.587; Epoch 1821.95.

The position remains as it was at the time of the earliest measures, but the distance is undoubtedly increased, as allowing $1\frac{1}{2}''$ for the diameter of the large star, the distance

ϵ Persei continued.

($2\frac{1}{2}$ diam. of L.) between the discs, together with a semi-diameter, will not amount to above 4″.5. (See the Catalogue of 1782). The following are Sir W. HERSCHEL'S measures of this star's position:

81° 28′ *nf*; 1782.45. H. Catalogue of 1782.
82 45 *nf*; 1802.83. MSS.

No. XL. R. A. $4^h\,9^m$; Decl. 26° 54′ N.

ϕ Tauri; STRUVE 118; V. 13.

Extremely unequal; large red, small bluish; does not bear a good illumination, and the measures are therefore of great difficulty.

Dec. 11, 1821.
Five-feet Equatorial.
sp

Position. ° ′		Distance. Parts.	
31.17	H	172. 8	H
29. 9	H	172. 8	H
28. 8	H	186. 0	H
30. 0	H	191. 9	H
29.21	H	187. 0	S
29.25	S	174. 0	S
29.46	S	177. 0	S
30.15	S	178. 5	S
28.38	S		
Mean = 29.33		Mean = 180.00	
		Z = − 0.02	
		179.98	

Position = 29° 33″ *sp*
Distance = 56″.841.

This star is unchanged, as will appear by the following measures:

Position 30° 27′ *sp*. HERSCHEL, Jun. 7 feet reflector, 1817.02

Distance 55″.625. Sir W. HERSCHEL, 1st Catalogue, 1780.73.

No. XLI. R. A. $4^h\ 12^m$; Decl. 25° 11′ N.

χ Tauri; STRUVE 119; IV. 10.

5 and $8\frac{1}{2}$ or 9 magnitudes.

Nov. 13, 1822.

Five-feet Equatorial.

nf

Position.	
° ′	
66.50	H
63.30	H
64.45	H
65.40	H
66.25	H
67. 6	S
67. 5	S
66.47	S
66. 0	S
67.21	S
67.30	S
Mean = 66.16	

Weather become unfavourable.

Position = 66° 16′ *nf*

Nov. 18, 1822.

Five-feet Equatorial.

nf

Position.	
° ′	
63.13	H
64.12	H
65.30	H
64.18	H
63.50	H
Mean = 64.13	

Position = 64° 13′ *nf*

Distance = 19″.692.

Stars ill defined, measures unsatisfactory.

Distance. Parts.	
66. 5	S
62. 0	S
60. 0	S
62. 0	S
63. 0	S
65. 8	S
60. 2	H
62. 5	H
65. 0	H
63. 8	H
62. 2	H
66. 0	H
Mean = 63.25	
Z = − 0.90	
62.35	

Feb. 11, 1823.

Five-feet Equatorial.

7 and 10 mag.

nf

Position.	
° ′	
68. 0	S
67.15	S
68. 5	S
68. 0	S
65.45	S
66.40	S
Mean = 67.17	

Position = 67° 17′ *nf*

Distance = 20″.509.

Distance. Parts.	
64. 3	S
67. 2	S
65. 5	S
65. 8	S
67. 3	S
67. 5	S
Mean = 66.27	
Z = − 1.33	
64.94	

χ Tauri continued.

Mean result,

Position 66° 4′ *nf;* distance 19″.962 ; 1822.9.

Other measures of this star are,

Position 65°19′ *nf;* HERSCHEL, Jun. Jan. 9, 1817. 7 feet reflector.
Distance 18″.75 ; Sir W. HERSCHEL. 1st Catalogue, 1782.

The star is difficult, and the measure of 1782 being called inaccurate, there is no ground to suppose any change in it.

No. XLII. R. A. 4^h 13^m ; Decl. 23° 52′ N.

62 Tauri ; STRUVE 121 ; IV. 109 ;

Double ; considerably unequal ; large white ; small purple ; several small stars in the field, and some very near.

Dec. 15, 1821.
Five-feet Equatorial.
nb

Position.		Distance. Parts.	
° ° ′ 90—70.53	H	94. 0	H
69.57	H	93. 2	H
69.36	H	90. 2	H
70.23	S	94. 0	H
70.34	S	91. 2	S
70.53	S	91. 0	S
		90. 8	S
		91. 6	S
		90. 3	H
		93. 1	H
Mean = — 70.23		Mean = 91.94	
		Z = + 0.05	
		91.99	

Position = 19° 37′ *np*
Distance = 29″.052.

Other measures of this star are,

Position 19° 0′ *np;* H. (exact estimation) (MSS.) 1783.00
21 12 *np;* Ditto, Second Catalogue 1783.75
Distance 28″.083 ; Second Catalogue 1783.75

No change, therefore, appears to have happened to it.

No. XLIII. H. C. 376; R. A. $4^h\ 18^m$; Decl. $53°\ 31'$ N.
1 Camelopardali, Struve 125;

Double; pretty unequal; large yellow, small certainly blue.

Jan. 18, 1822.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
° ° '			
90—53. 6	H	32. 9	H
54. 2	H	36. 0	H
54.30	H	31. 9	H
54. 7	H	33. 2	H
52.30	S	34. 4	H
53.15	S	35. 8	S
53. 5	S	33. 7	S
53.30	S	34. 4	S
54. 0	S	33. 5	S
		32. 9	S
		32. 3	S
Mean = — 53.34		Mean = 33.73	
		Z = — 0.64	
		33.09	

Position = 36° 26′ *np*
Distance = 10″.450.

1821.22; Position 34° 24′ *np*; Distance . . . . Struve, Dorp. Obs. iii. 135. 4 Obs.

No. XLIV. R. A. $4^h\ 21^m$; Decl. $42°\ 39'$ N.
57, m, Persei; Struve 127; VI. 99;
Nearly equal.

Nov. 29, 1821.
Five-feet Equatorial.
sp

Position.		Distance Parts.	
° '			
70.50	S	348. 1	S
71. 1	S	349. 4	S
71.28	S	349. 0	S
71.41	H	349. 3	S
71.30	H	348. 9	H
71. 1	H	349. 4	H
70 28	H	350. 2	H
Mean = 71. 8		Mean = 349.19	
		Z = — 0.28	
		348.91	

Position = 71° 8′ *sp*
Distance = 1′ 50″.193.

57, m, Persei continued.

The earlier measures, recorded in the Second Catalogue, are,

Position 71° 51′ *sp*; Distance 96″.42; 1783.66 and 1783.27.

This is an extraordinary change of distance, not less than thirteen or fourteen seconds, or one-seventh of the whole; and is the more remarkable as the angle seems to have undergone no change. This star, therefore, merits careful examination. The measure of 1783 is regularly entered and rightly cast up.

No. XLV. R. A. $4^h\ 26^m$; Decl. 9° 47′ N.

88, d, Tauri; STRUVE 130; VI. 31;(*)

Considerably unequal; 5th and 8th magnitudes.

Nov. 18, 1822.

Five-feet Equatorial.

np

Position.		Distance. Parts.	
° ° ′ 90 — 61.15	H	221. 0	H
62. 0	H	222. 4	H
61. 5	H	222. 5	H
61.59	H	223. 1	H
60.50	H	219. 8	H
60.35	S	219. 6	H
60.24	S	220. 2	S
60.41	S	218. 4	S
60.28	S	219. 5	S
60.50	S	221. 8	S
		220. 7	S
Mean = — 61. 1		Mean = 220.82	
		Z = — 0.90	
		219.92	

Position = 28° 59′ *np*

Distance = 1′ 9″ 455.

Sir W. HERSCHEL makes the distance 70″.625 (1st Catalogue); 1780.8, agreeing almost precisely with ours. The angle is not given by him.

(*) In STRUVE'S Catalogue, this star is erroneously called VI. 88.

No. XLVI. R. A. $4^h\ 35^m$; Decl. 9° 9′ S.

55 Eridani; STRUVE 136; III. 99;

Double; equal; magnitudes each 6 ½;

Dec. 21, 1821.

Five-feet Equatorial.

np or *sf*

Position.		Distance. Parts.	
° ° ′			
90—42.42	H	34. 1	H
42.35		35. 2	
43.30		32. 8	
41.42		33. 2	
42.45		34. 2	S
40.32	S	33. 8	
41. 3		34. 1	
40.50		33. 0	
40.24		Mean = 33.80	
40.42		Z = — 0.52	
Mean = —41.40		33.28	

Position = 48° 20′ *np* or *sf*
Distance = 10″.510.

The measures of this star are thus stated in the Catalogues of 1782:

Position 44° 9′ *np*; Distance 9″.15; 1783.08.

The change in the angle is not sufficient to ground any conclusion on. The distance seems a little on the increase.

M. STRUVE, (1820.99) makes the angle 52° 1′ *np*. Dorpat Obs. iii. p. 134.

No. XLVII. R. A. $4^h\ 47^m$; Decl. $37^\circ\ 36'$ N.

ω Aurigæ; STRUVE 140; II. 14;

Double; very unequal; large garnet; small blue decidedly, and is exceedingly faint, but is very much improved by illumination.

Nov. 29, 1823.
Five-feet Equatorial.
np

Position.		
°	° ′	
90—	6.23	H
	5.32	H
	8.50	H
	4.44	H
	5.55	H
	7.20	H
	11.40	S
	10.25	S
	12.30	S
	11.10	S
	11.58	S
Mean = —	8.46	

Distance. Parts.	
24. 0	H
24. 2	H
25. 3	H
26. 5	S
25. 7	S
25. 9	S
Mean = 25.27	
Z = — 0.28	
24.99	

Position = $81^\circ\ 14'$ *np*
Distance = $7''.892$.

Dec. 15, 1821.
Five-feet Equatorial.
np

Position.		
°	° ′	
90—	10.45	H
	7. 0	H
	6.32	H
	7.30	H
	8.44	H
	7.58	S
	7.20	S
	5. 0	S
	5.50	S
	6. 4	S
Mean = —	7.12	

Position = $82^\circ\ 48'$ *np*
The Measures of Angle very difficult.

Mean Result.

Position $82^\circ\ 1'$ *np*; *Distance* $7''.892$; *Epoch* 1822.9.

Other measures of this star are,

Position $82^\circ\ 37'$ *np*; Oct. 20, 1781. HERSCHEL. 1st Catal.
79 26 *np*; Oct. 30, 1802. Do. MSS. Journal.

ω Aurigæ continued.

Distance 2, $2\frac{1}{2}$, 3, diameters of L. 1779. 1st Catalogue.
6″, 8″, 10″, perhaps. MSS. 1780.

The angle of Position appears perfectly constant. With regard to the distance, the earlier observations are too vague to place any reliance on.

No. XLVIII. R. A. $4^h\,48^m$; Decl. $5^\circ\,28'$ S.

62 Eridani; Struve 142; VI. 106;

Very unequal; large white, small blue; the small star bears illumination very well.

Dec. 21, 1821.
Five-feet Equatorial.
nf

Position. ° ′		Distance Parts.	
16. 3	S	208. 5	S
16. 0	S	209. 2	S
15.40	S	209. 9	S
15.31	S	209. 2	S
14. 0	H	208. 5	H
14.39	H	209. 8	H
15.16	H	208. 8	H
15. 0	H	208. 7	H
Mean = 15.16		Mean = 209.07	
		Z = − 0.52	
		208.55	

Position = $15^\circ\,16'$ *nf*
Distance = $1'\,5''.865$.

Sir W. Herschel's measures of this star are,
Position $15^\circ\,9'$ *nf*; Distance $60''.43$; 1783.04 (2d Catalogue.) We have here an increase of $5''.435$ in the distance, which is too much to be attributed to error of observation.

No. XLIX. R. A. $4^h\ 49^m$; Decl. $14^\circ\ 15'$ N.

26 BODE Orionis; STRUVE 144;

Double; unequal.

January 28, 1822.

Five-feet Equatorial.

np

Position.		Distance. Parts.	
$90^\circ - 54^\circ.37'$	H	125. 0	H
56.55	H	120. 0	H
55.45	H		
55. 4	H		
Mean = − 55.35		Mean = 122.05	
		Z = − 0.64	
		121.86	

Position $= 34^\circ\ 25'$ *np*

Distance $= 38''.486$.

The haze so considerable that no tolerable measures of distance can be procured.

February 13, 1822.

Triple; A, yellow; B, blue; C, bluish. A, 7th, B, 8th, C, 15th Magnitudes.

Five-feet Equatorial.

Measures of A B

np

Position.		Distance. Parts.	
$90^\circ - 56^\circ.\ 0'$	H	123. 5	H
55. 5	H	122. 9	H
55. 0	H	123. 6	H
55.10	H	124. 5	H
55.40	S	123. 5	S
55.10	S	123. 0	S
55. 5	S	122. 9	S
55.24	S	124. 0	S
		123. 8	S
Mean = − 55.19		Mean = 123.52	
		Z = − 0.34	
		123.18	

Position $= 34^\circ\ 41'$ *np*

Distance $= 38''.903$.

Mean Result.

Position $34^\circ\ 36'$ *np*; *Distance* $38''.827$; *Epoch* 1822.09.

Measures of AC.

nf

Position.	
$1^\circ.47'$	H
1. 0	H
0.50	S
1.10	S
Mean = 1.12	

Position $= 1^\circ\ 12'$ *nf*.

No. L. R. A. $5^h\ 0^m$; Decl. $8°\ 53'\ 30''$ S.

Near λ Eridani; IV. 43.

Double; very unequal; (λ itself in the field, and decidedly single); very difficult to measure. Magnitudes 5 and 8.

Dec. 21, 1821.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
9.59	H	68. 7	H
11.45	H	71. 0	H
11.28	H	71. 5	H
11. 2	H	69. 2	H
11.12	H	69. 0	S
8.30	S	69. 2	S
8.30	S	67. 9	S
8.55	S	68. 5	S
10.16	S	69. 9	S
9.31	S		
10. 2	S		
Mean = 10. 6		Mean = 69.43	
		Z = − 0.52	
		68.91	

Position = $10°\ 6'$ *nf*

Distance = $21''.763$.

Obs^d. Right Asc^n $4^h\ 59'\ 50''.83$.

This star (IV. 43) is called λ Eridani in the Catalogue of 1782; Bode, Struve and South also call it λ. Its true place, as given by a twenty-feet sweep of Dec. 19, 1786, is $0^m\ 48^s$ preceding, and $0°\ 5'$ north of λ, which our observations verify. There is therefore no doubt of the star's identity. A MSS measure of Sir W. Herschel (Jan. 17, 1809) gives $6°\ 41'$ *nf* for its angle of position (single measure).

No. LI. R. A. $5^h\ 4^m$; Decl. $45°\ 48'$ N.

Capella.

Large white; small bluish; extremely unequal.

March 21, 1821.

np

Position. ° ′		Distance. Parts.	
78. 2	S	1433. 9	S
78.15	S	1443. 2	S
78. 3	S	1437. 5	S
78. 0	S	1434. 0	S
78. 2	S	1439. 0	S
77.45	S	1442. 3	S
78. 9	S	1437. 9	S
Mean = 78. 2		Mean = 1438.25	
		Z = − 0.08	
		1438.17	

Position = $78°\ 2'$ *np*

Distance = $7'.34''.206$.

No. LII. R. A. $5^h\ 4^m$; Decl. 32° 28′ N.

14 Aurigæ; STRUVE 159; IV. 19;

Double; very unequal; lovely night; stars perfectly round, and steady.

Feb. 3, 1822.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
44.46	H	46. 1	H
45. 8	H	48. 2	H
45.14	H	48. 1	H
46.12	H	48. 5	H
46. 0	S	46. 4	S
45.33	S	46. 8	S
45.51	S	47. 2	S
46.14	S	48. 3	S
Mean = 45.37		Mean = 47.45	
		Z = — 1.19	
		46.26	

Position = 45° 37′ *sp*.
Distance = 14″.610.

Other measures of this star are,

Position 37° 38′ *sp*. (H. Catal. of 1782). - 1781.83
46 3 *sp*; STRUVE, Dorpat Obs. iii.—p. 135,
10 measures 1821.25

Distance 15″ 0 H. MSS. Observation. 1780.74
16 13 "inaccurate; liable to 2″ or 3″ error."
(Cat. of 1782) 1781.83

The position appears to have altered considerably (8°), but the distance remains unchanged, if we reject the inaccurate observation of 1781.

No. LIII. R. A. $5^h\ 6^m$; Decl. 8° 25′ S.

β Orionis, Rigel; STRUVE 163; II. 33;

Extremely unequal; large white; small bluish; 1st and 10th magnitudes.

Feb. 5, 1822.
Five-feet Equatorial.
sp

Position.		Distance. Parts.	
68° 4′	H	27. 0	H
69.46	H	29. 5	H
68.14	H	28. 4	H
71.10	H	28. 2	H
70.14	H	26. 5	S
69.23	S	27. 0	S
68.58	S	27. 5	S
68.37	S	27. 9	S
68.30	S	28. 8	S
70. 0	S		
69.31	S		
Mean = 69.19		Mean = 27.87	
		Z = + 0.24	
		28.11	

Position = 69° 19′ *sp*
Distance = 8″.878.

(beautifully defined).

Other measures, chiefly extracted from Sir W. HERSCHEL'S MSS. Observations, are:

Position.

First period 1781—1784.

1781.75	68° 12′ *sp* (H. 1st. Cat.)	
1782.70	66 28	MS
1782.83	73 15	MS
———	74 0	MS
1782.98	71 42	MS
1783.03	66 3	MS
1783.04	65 39	MS
1783.15	66 39	MS
1783.72	72 36	MS
———	77 54	MS
1783.78	66 51	MS
1784.17	69 33	MS
———	73 9	MS
———	69 51	MS
1783.32	70 8 = Mean 1st period.	

Second period 1796—1802.

1796.03	71° 13′	MS
1798.12	72 11	MS
1799.90	74 15	MS
1800.06	68 19	MS
1800.07	73 25	MS
———	67 43	MS
1800.13	65 7	MS
———	66 44	MS
1800.21	60 26	MS
1801.99	67 7	MS
———	64 37	MS
Mean 2d period 1799.88	= 68 17	

Mean of 11 observations from Jan. 1, 1802, to Feb. 1803;) (Account of Changes) 69° 5′ *sp.*

The mean of all the 36 measures, allowing each an equal weight, comes out 69° 15′ *sp*, differing only 4′ from ours.

1821.30. 74° 53′ *sp*; STRUVE, mean of 8 measures, Dorpat Obs. iii.

β Orionis, Rigel; continued.

Distance.

1781.81 Mean of 6 measures taken in 18 months.
"Account of Changes, &c." - - - 9″. 53
1821.30; STRUVE, Dorpat Obs. iii. *ut supra* - 9 .250

This series of measures affords a striking example of the difficulty of estimating exactly the position of the line joining the centres of two close and very unequal stars, and placing the moveable wire of the micrometer parallel to this imaginary line. The way in which the same mean results from series of observations so discordant, is an instance no less remarkable of the efficacy of multiplying even inaccurate observations, when made under such variety of time and circumstance as to avoid any possible bias.

The slight diminution (— 0″.652) in the distance may very possibly be owing to a real change.

No. LIV. R. A. $5^h\ 13^m$; Decl. 3° 21′ N.

23 Orionis; STRUVE 172; IV. 84;

Double; considerably unequal; large white; small blue.

Jan. 17, 1822.

Five-feet Equatorial.

nf

Position.		Distance. Parts.	
° ′			
60.57	H	105. 1	H
62.55	H	106. 6	H
61. 9	H	106. 7	H
62.50	H	104. 8	H
63. 5	H	105. 5	S
64. 0	S	103. 0	S
63.10	S	103. 9	S
62.30	S	104. 2	S
63. 0	S		
63. 5	S		
Mean = 62.40		Mean = 104.97	
		Z = — 0.34	
		104.63	

Position = 62° 40′ *nf*
Distance = 33″.043.

23 Orionis continued.

Other measures of this star are,

Position $59^\circ\ 33'$ *nf*;	HERSCHEL. Catalogue of 1785,	1783.73
$59\ 55$ *nf*;	HERSCHEL, Jun. A careful measure,	1817.07
$62\ \ 36$ *nf*;	STRUVE, Dorpat Obs. iii. p. 135,	1820.71
Distance $32''.800$.	Sir W. HERSCHEL, MSS. -	1782.75

No material change therefore appears to have happened to this star.

No. LV. R. A. $5^h\ 18^m$; Decl. $25^\circ\ 0'$ N.

118 Tauri; STRUVE 182; II. 75;

Double; a little unequal; 6 and $6\frac{1}{2}$ magnitudes; both white.

Dec. 21, 1821.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.	
76.12	H	19. 8	H
77. 6	H	20. 0	H
77. 4	H	18. 3	H
76. 0	H	18. 7	H
75.20	S	16. 7	H
75. 7	S	18. 2	S
75.20	S	18. 0	S
75.41	S	17. 3	S
		19. 3	S
		18. 3	S
Mean = 75.59		Mean = 18.46	
		Z = − 0.52	
		17.94	

Position $= 75^\circ\ 59'$ *sp*

Distance $= 5''.666$.

Other measures are,

Position $77^\circ\ 15'$ *sp*;	Sir W. HERSCHEL. Cat. of 1785,	1783.75
$75\ \ \ 0$ *sp*;	HERSCHEL, Jun. - -	1817.20
Distance $5''.030$.	Catalogue of 1785, -	1783.75

This star therefore remains unaltered.

No. LVI. R. A. $5^h\ 21^m$; Decl. $5^\circ\ 48'$ N.

32 Orionis; STRUVE 187; I. 25.

Double; in contact with a power of 303; unequal.

Position.	Feb. 5, 1822.	
67.° 0′ } H	Five-feet Equatorial.	Measure of distance impracticable, but certainly less than a diameter of one wire, or four parts of the micrometer screw head.
67. 0 } H	*sp*	
66.15 } S	Position = 66°.49′ *sp*	
67. 0 } S	Distance less than 1″.3.	
Mean = 66.49		

The position in the Catalogue of 1785 is 52° 10′ *sp*

1802 Jan. 12. HERSCHEL, MSS. 65 38 *sp*

1802 Jan. 22. Ditto. Mean of two 53 26 *sp*.

The measures of this star are of the utmost difficulty; and from their great discordance little or nothing can be collected, but that the angle of position is not liable to any very rapid change, and is not far from 60° *sp*.

No. LVII. R. A. $5^h\ 21^m$; Decl. $3^\circ\ 11'$ N.

Near 33 Orionis.

7th and 9th magnitudes.

Position.	Feb. 21, 1823.	Distance. Parts.
90°—29°. 5′ } H	Seven-feet Equatorial.	102. 0 } H
25.46 } H	*sf*	106. 0 } H
25.31 } H		101. 0 } H
25.32 } H		100. 5 } H
29.10 } H	Position = 62°.41′ *sf*	107. 4 } H
28.49 } H	Distance = 24″.731.	
Mean = —27.19		Mean = 103.38
		Z = + 1.29
		104.67

No accuracy in the determination of the place of this star, which was found in looking for 33 Orionis. The declination may be some minutes in error.

No. LVIII. R. A. $5^h\ 22^m$; Decl. $16^\circ\ 55'$ N.

sp 117 Tauri; III. 93;*

Nearly, or almost precisely equal; magnitudes 6 and 6 +; both white.

Dec. 15, 1821.

Five-feet Equatorial.

sf

Position.	
90°—38°.22′	H
37. 0	H
39.54	H
38.31	H
38. 1	H
37.15	S
36.58	S
36.15	S
35.41	S
39. 0	H
37.28	S
38.30	H
38.57	S
38.50	S
38.22	S
Mean = — 37.56	

Distance. Parts.	
30. 8	H
31. 5	H
31. 0	H
30. 2	S
31. 9	S
30. 3	S
Mean = 30.95	
Z = + 0.05	
31.00	

Position $= 52^\circ.4'$ *sf*

Distance $= 9''.790$.

* The description of this star agrees with that of III. 93 in the Catalogue of 1785, but the star is there called 117 Tauri. It is, in consequence, inserted in the Catalogues of Struve and South as 117: 117 however is single, and this star was found by us in sweeping for it. On consulting the original MSS. we find the following observation, which clearly establishes the identity of III. 93 with the star measured by us.

" III. 93. Fl. 117 Tauri Sequens ad Austrum.

" About 1° *sf* the 117 Tauri in the direction of 111—117; nearly, or about 1° " prec. 122 Tauri. Also in a line with 115, parallel to one drawn through ζ Tauri " and γ Geminorum. Double; nearly equal; or the preceding rather the largest. " 3d Class."

A subsequent observation, it is true, calls it again 117 Tauri; but the very circumstantial description of its place here given, agrees in every particular with our star.

Position 52° 27′ *sf*; Herschel, Catalogue of 1785; 1783.75.

Distance 12″.200; Herschel, Catalogue of 1785; 1783.00.

The distance, therefore, has undergone a material diminution.

LIX. R. A. $5^h\ 22^m$; Decl. $3°\ 9'$ N.

33, *n* Orionis; STRUVE 188; I. 22;

Double; considerably unequal; very close; large white, small blue; 6 and 8 magnitudes. A third star, C, in the field, *np*, of 8th magnitude.

Position.	Feb. 5, 1822.	Distance. Parts.
° '	Five-feet Equatorial.	
68. 0 H	*nf*	7. 0 H
66.14 H		5. 7 H
61.40 H		
65.32 H		Mean = 6. 35
68.28 H	Position = 65°.49' *nf*	Z + 0. 24
Mean = 65.59	Distance = 2''.080.	6. 59

Position of the distant star = 55° 40' *np*; Distance 4' 20''.945 (single measures.)

Position.	March 22, 1823.	Distance. Parts.
° '	Five-feet Equatorial.	
59.30 S	*nf*	7. 8 S
60. 5 S		8. 0 S
59.30 S		7. 6 S
62.30 S		7. 2 S
62.45 S		7. 9 S
63.30 S	Position = 61°.18' *nf*	Mean = 7.07
Mean = 61.18	Distance = 1''.979.	Z = − 1.43
		6.27

Position.	Measures of A C
° ° '	*np*
90—33.44 S	
33.58 S	
33.50 S	Position = 56°.9' *np*
Mean = − 33.51	Distance = 4'.18''.523, a single measure, S.

Mean result.

Position of AB 63° 21' *nf*; *Distance* 2''.025; *Epoch* 1822.64.
AC 55 54 *np*; 4' 19''.734.

33, *n* Orionis continued.

Other measures of this star are,

A B	Pos. 61° 23′ *nf*;	Sir W. H. MSS.*	Dist. ½ diam. of S. 1781.81
	57 57 *nf*;	Do. MSS.	Mean of 2 Obs. Jan. 12 and 22. 1802.04.
	67 4 *nf*;	STRUVE, Dorpat Obs. iii. 133.	Obs. 31. 1820.18.

The extreme closeness of the stars AB, renders the measures of the angle very precarious, and there is no evidence of any material change.

No. LX. R. A. $5^h\ 23^m$; Decl. 0° 27′ S.

δ Orionis; STRUVE, 189; V. 10;

Double; considerably unequal: large white, small purple: 2nd and 6th magnitudes.

Dec. 21, 1822.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
90. 0	H	175. 1	H
90. 0	H	174. 8	H
90. 3	H	177. 0	H
89.30	H	175. 0	H
90.10	H	175. 4	H
90.30	S	174. 7	S
90.18	S	177. 0	S
90.30	S	176. 5	S
89.58	S	173. 5	S
89.35	S	174. 1	S
Mean = 89.57		Mean = 175.31	
		Z = — 1.56	
		173.75	

Position = 89°.57′ *nf*

Distance = 54″.875.

The measures of Sir WILLIAM HERSCHEL, recorded in his first Catalogue, show that this star has undergone no material change in angle, but perhaps a very slight increase of distance. They are

Position (1781.91) 88° 10′ *np*; Distance (1780.78) 52″.968.

* The angle given in the printed Catalogue (60° 55′) is erroneously reduced.

No. LXI. R. A. $5^h\ 23^m$ Decl. $2^\circ.39'$ N. (Nova.)

8th and 9th magnitudes.

Dec. 21, 1822.
Five-feet Equatorial.
np

Position. ° ′		Distance. Parts.	
90—6.10	H	222. 0	H
7.38	H	220. 0	H
6.32	H	219. 2	H
6.24	H	218. 0	H
6. 0	H	218. 5	H
6.55	S	218. 3	S
7.30	S	217. 5	S
7.14	S	221. 0	S
6.50	S	222. 1	S
7.15	S	221. 0	S
Mean = —6.51		Mean = 219.76	
		Z = — 1.56	
		218.20	

Position = $83^\circ.9'$ *np*
Distance = $1'.8''912$.

No. LXII. R. A. $5^h\ 25^m$; Decl. $9^\circ\ 48'$ N.

λ Orionis; STRUVE, 191; II. 9;

Double; pretty unequal; 5th and 7th magnitudes.

Feb. 5, 1822.
Five-feet Equatorial.
nf

Position. ° ′		Distance. Parts.	
50. 0	H	17. 0	H
49.37	H	16. 3	H
49. 3	H	18. 4	H
48.17	H	17. 7	H
48. 6	H	16. 9	H
49. 5	S	18. 0	S
49.33	S	17. 8	S
49.44	S	16. 5	S
49.30	S	17. 5	S
49.30	S	18. 0	S
Mean = 49.14		Mean = 17.41	
		Z = + 0.24	
		17.65	

Position = $49^\circ.14'$ *nf*
Distance = $5''.574$.

λ Orionis continued.

Other measures are,

Position	45° 14′ *nf*;	HERSCHEL.	1st Catalogue.	1779.88
	47 15 *sp*; (? *nf*)	Ditto.	(MSS.)	1802.15
	50 14 *nf*;	HERSCHEL, Jun.	7 feet reflector	1817.02
	52 8 *nf*;	STRUVE,	Dorpat Obs. iii.	1821.20.

Distance 5″.833; H. 1st Catalogue, mean of 3 measures, 1780.04

4 .965; STRUVE. Dorpat Obs. iii. from △ decl. = 3″.743. 1821.20.

The slight disagreement of the earlier angles is not sufficient to authorize any conclusion as to the motion of this star.

No. LXIII. R. A. $5^h 30^m$; Decl. 2° 43′ S.

σ Orionis; STRUVE, 198; II, 10, 11.

A very pretty double triple Star.

A, the 5th. B, the 7th. C, the 6th magnitudes; these form the bright set. D and E, each of the 9th or 10th magnitude, and F, the 8th; these constitute the faint set.

The Bright Set.

Nov. 18, 1822.

Five-feet Equatorial.

Measures of AB of the Bright Set.

nf

Position.		Distance. Parts.	
6°.15′	H	40. 2	H
6.43	H	44. 6	H
8. 0	H	41. 0	H
7.28	H	42. 4	H
6.12	S	43. 2	H
6.18	S	Mean = 42.28	
6.22	S	Z = — 0.90	
6.48	S	41.38	
6. 0	S		
Mean = 6.41			

Position = 6°.41′ *nf*

Distance = 13″.069.

σ Orionis continued.

Measures of AC of the Bright Set.

nf

Position.	
° ′	
29.41	H
29.10	H
29.27	H
29.20	H
29.55	H
29.25	S
28.14	S
27.55	S
27.25	S
29. 0	S
Mean = 28.57	

Position = 28°. 57′ *nf*
Distance = 42″765

Distance Parts.	
137. 0	H
137. 1	H
135. 0	H
132. 6	H
133. 0	H
137. 3	S
139. 0	S
137. 5	S
136. 8	S
137. 8	S
Mean = 136.31	
Z = − 0.90	
135.41	

March 8, 1823.

Five-feet Equatorial.

nf

Measures of AB

Distance = 12″. 942

Distance. Parts.	
41. 0	S
40. 5	S
40. 2	S
42. 0	S
40. 8	S
41. 0	S
41. 5	S
Mean = 41.00	
Z = − 0.02	
40.98	

No. LXIV. σ Orionis (No. II.) continued.

Measures of the two bright stars A D of each triple set, taken to connect the two sets.

March 8, 1823.

Five-feet Equatorial.

np

° ° ′	
90—36.40	S
37.14	S
37.30	S
36.50	S
Mean = — 37. 3	

Position = 52°. 57′ *np*
Distance = 3′.30″.805, a single measure S.

No. LXV. σ Orionis (No. III.) continued.

South following and north following of the star A of the bright set of σ are two distant stars, G and H; the former

σ Orionis (No. III.) continued.

of the 10th magnitude, the latter of the 11th or $10\frac{1}{2}$. They may be useful perhaps at some future period, in ascertaining the extent of motion to which any of the closer stars of the triple sets may be liable.

March 8, 1823.
Five-feet Equatorial.
Measures of A G
sf

Position.	
° ° ′	
90—56.12	S
56.20	S
56. 5	S
56.15	S
56.30	S
Mean = —56.16	

Position $= 33^\circ\ 44'$ *sf*
Distance $= 5'\ 10''\ 131$ (*s*), a single measure.

Measures of A H
nf

Position.	
° ′	
31.25	S
30.50	S
31.20	S
31.10	S
Mean = 31.11	

Position $= 31^\circ\ 11'$ *nf*
Distance impracticable to night.

March 9th, Distance $= 8'\ 48''.680$, a single measure (*s*).

March 11, 1823.
Seven-feet Equatorial.
Measure of A H

Distance $8'.\ 42''.071$, a single measure (*s*).

A line drawn through G and A will pass exactly between the two stars D and E.

A line drawn through G and C will bisect F, or perhaps will be in contact with the apparently inferior edge of the star.

If the wire pass through A and C the star H will be its own diameter, or perhaps diameter and a half, apparently below it.

No. LXVI. σ Orionis (No. IV.) continued.

The Faint Set.

Triple D and E each of the 10th or 11th magnitude; F of the 9th.

Position.	Feb. 21, 1823.	Distance. Parts.
° ′	Seven-feet Equatorial.	
0.30 H	Measures of D E	46. 5 H
0.36 H	*sp*	50. 0 H
2. 5 H	Position $= 2^\circ\ 15'$ *sp*	47. 6 H
5. 2 H	Distance $= 11''.311$.	45. 2 H
3. 0 H	Measures of Angle and of Distance extremely difficult.	48. 5 H
Mean = 2.15		Mean = 47.56
		Z = − 0.52
		47.04

Position.	Measures of D F	Distance. Parts.
° ′	Seven-feet Equatorial.	
66. 0 H	*n f*	275. 0 H
67. 5 H	Position $= 66^\circ.\ 31'$ *nf*	278. 0 H
65.26 H	Distance $= 1'.\ 8''257$	277. 0 H
66.53 H		300. 0 H
67.13 H		292. 0 H
Mean = 66.31		Mean = 284.40
		Z = − 0.52
		283.88

Position.	March 11, 1823.	Distance. Parts.
° ′	Seven-feet Equatorial.	
4.35 S	Measures of DE	43. 5 S
3.40 S	*sp* or *nf*	44. 5 S
3.52 S	Position $= 4^\circ.\ 39'$ *sp* or *nf*	43. 5 S
5.15 S	Distance $= 10''.962$	46. 5 S
4.10 S		43. 5 S
5.32 S		
5.30 S		
Mean = 4.39		Mean = 44.30
		Z = + 1.29
		45.59

Position.	Measures of DF	Distance. Parts.
° ′	*nf*	
68.30 S	Position $= 69^\circ.\ 35'$ *nf*	278. 0 S
69.40 S	Distance $= 1'.\ 8''.252$	288. 0 S
70. 0 S		283. 0 S
69.50 S		289. 0 S
69.30 S		279. 0 S
70. 0 S		280. 0 S
		281. 0 S
Mean = 69.35		Mean = 282.57
		Z = + 1.29
		283.86

σ Orionis (No. IV.) continued.

Mean Result.

Position of AB	6° 41′ *nf.*	Distance	12″.912	1822.88
AC	28 57 *nf.*		42 .765	——
AD	52 57 *np.*		3′ 30 .805	1823.18
DE	3 39 *sp.*		11 .136	1823.16
DF	68 11 *nf.*		1′ 8 .255	——
AG	33 44 *sf.*		5 10 .131	1823.19
AH	31 11 *nf.*		8 45 .375	——

Other measures of this Star are,

Position of AB	5° 5′ *nf.*	Sir W. H. Catalogue of 1782.	Dist. AB 13″.437 (diams. included) MS.
AC	29 5 *nf.*		
DE	2 or 3° *sp.*		Dist. AC 43″.20 Catal. of 1782.
DF	66 35′ *nf.*		

Position of AB 6 30 *nf*; Distance 13″.6; 1819; Struve, addit. p. 184.

AC 28 21 *nf*; 41″.5; 1819; Ditto.

No. LXVII. R. A. $5^h\,32^m$; Decl. 2°.3′ S.

ζ Orionis; Struve 200; IV. 21;

Very close, double; large, yellowish white; small, bluish or grey.

The measures are taken with 303, but seen double by us both with 133.

ζ Orionis continued.

Feb. 3, 1822.
Five-feet Equatorial.
sf

Position. ° ° ′		Distance. Parts.	
90—29.12	H	8. 0	H
31.20		8. 9	
29. 5		9. 3	
28.46		9. 8	
31.43		8. 1	
28.45		10. 0	
29. 0			
29. 0	S	8. 9	S
28. 5		8. 7	
30. 1		9. 6	
30. 9		9. 3	
30.18		10. 2	
30. 9		9. 4	
Mean = —29.39		Mean = 9.18	
		Z = — 1.19	
		7.99	

Position = 60°.21′ *sf*
Distance = 2″.523.

(Exquisitely defined. The division quite sharp and black, and the stars themselves like a shilling and a sixpence, side by side.)

Feb. 19, 1823.
Five-feet Equatorial.
sf

Position. ° ° ′			Distance. Parts.	
90—30.35	S	with 133	11. 0	S
30.30			11. 8	
30.40		with 303	11. 5	
31. 0			12. 0	
30.50				
Mean = —30.43			Mean = 11.57	
			Z = — 2.29	
			9.28	

Position = 59°.17′ *sf*
Distance = 2″.930.

North following and distant is a very faint Star C, if we call the brighter of the close Stars A.

Position of AC *nf.*

° ′	
82.30	S
83.18	
82.42	
Mean = 82.50	

Position = 82°.50′ *nf.*

Mean result.

Position of A and B 60° 3′ *sf*; Distance 2″.625 1822.61
A and C 82 50 *nf.*

1821.24. Position of AB 57°48′ *sf*; STRUVE, Dorpat Obs. iii. p. 135.

ζ Orionis was observed by Sir WILLIAM HERSCHEL as a double star of the 4th Class, the position being stated at 83° 25′ *nf* (Catalogue of 1782), which agrees perfectly with our measure; but neither in that Catalogue, nor in the subsequent one of 1785, is there any mention of the separation of the large star into two. Yet, had it been then as distinctly separated as at present, it is not possible it could have been overlooked, when kept long enough in view to take an accurate measure, in the course of which the attention must have been closely directed to either star. Still less could it have escaped notice in the reviews of the heavens, in the course of which it has often been examined with minute attention with reference to this very point, as the Journals written at the time testify. On the 29th of September, 1782, during one of the reviews on which the Catalogue of 1785 is founded, it was examined with the 7 feet reflector, power 460, and is called "white, *distinctly round*, double," the double referring obviously to the more distant star, and the "distinctly round" to the principal, or central one, according to usual custom. A beautiful star of the first class could never have escaped registering by neglect, when the object was expressly to form a Catalogue of such stars, and we are therefore forced to conclude, that in 1782, the small star was so closely covered by the large one, as not even to elongate its disc.

ζ Herculis and δ Cygni have afforded instances of sidereal occultations, in which one star has completely disappeared behind the other, and σ Coronæ appears to be on the point of performing the same singular evolution. This is the first instance, however, of the reverse process, for the observation

ζ Orionis continued.

of M. FLAUGERGUES, on ζ Ursæ Majoris, (mentioned under the head of that star), which would be a strong case in point, is proved to have been an illusion. So remarkable a fact deserves every attention, and this star should be assiduously watched.

No. LXVIII. R. A. $5^h 47^m$; Decl. $37° 11'$ N.

θ Aurigæ; STRUVE 213; V. 89, and VI. 34;

Excessively unequal; 4th and 15th magnitudes.

Feb. 21, 1823.

Seven-feet Equatorial.

Position.		Distance. Parts.
° ° ′ 90—8.35 } H	*np*	534. 0 } H
7. 0	Position = 82°.16′ *np*	510. 0
7.45	Distance = 125″.051	511. 0
7.33		521. 0
7.46		527. 0
Mean = — 7.44	Measures of extreme difficulty.	Mean = 520.16
		Z = — 0.52
		520.09

The star whose relative place with respect to the large one is here ascertained, is that which makes it double of the 6th class; but what is become of the nearer star?

Nov. 13, 1823. Seven-feet Equatorial.

Triple. A = 4 *m.* B = 9 *m.* C = 10 *m.* A fourth star D = 11 or 12 *m* suspected. A and C make a double star of the 4th or 5th class. The night unfavourable.

No. LXIX. R. A. 6^h 14′; Decl. 4° 41′ N.

8 Monocerotis; STRUVE 222; III. 29;

Considerably unequal; large yellow; small purplish; 6th and 8th magnitudes.

Dec. 21, 1822.

Five-feet Equatorial.

nf.

Position. ° ′		Distance. Parts.	
62.35	H	46. 0	H
64.58	H	48. 1	H
63.33	H	47. 3	H
64.38	H	46. 0	H
64. 0	H	46. 7	H
66. 0	S	50. 8	S
65. 5	S	48. 3	S
64.27	S	47. 3	S
64.33	S	49. 5	S
64.28	S	47. 5	S
Mean = 64.26		Mean = 47.75	
		Z = − 1.56	
		46.19	

Position = 64°.26′ *nf*

Distance = 14″.588.

Feb. 12, 1823.

Five-feet Equatorial.

nf

5th and 7th magnitudes.

Position. ° ′		Distance. Parts.	
63.28	H	46. 6	H
63.55	H	45. 0	H
63.59	H	45. 1	H
64. 0	H	47. 0	H
65. 0	H	45. 1	H
65.58	S	47. 0	S
64.50	S	46. 2	S
65.15	S	47. 1	S
65.43	S	46. 9	S
66. 0	S	46. 0	S
64.40	H		
65.14	H		
Mean = 64.50		Mean = 46.20	
		Z = − 1.33	
		44.87	

Position = 64°.50′ *nf*

Distance = 14″.171

Mean result.

Position 64° 39′ *nf*. Distance 14″.379. Epoch 1823.04.

1820.99; 66 45 *nf*. Distance 13″.202 from △ decl. 12″.13. STRUVE, Dorpat Obs. iii.

In the Catalogue of 1782 no angle is given; and only an estimated distance "about 12″."

No. LXX. R. A. $6^h\ 17^m$; Decl. $20^\circ\ 54'$ N.

15 Gemini; STRUVE 224; V. 52, id. V. 56;

Double; considerably unequal; large white; small blue; 7th and 9th magnitudes.

Feb. 3, 1822.
Five feet Equatorial.
sp

Position. ° ′		Distance. Parts.	
66.33	H	107. 0	H
63.56	H	104. 6	H
63.42	H	106. 7	H
63.15	H	107. 3	H
64.14	H	102. 0	S
67. 0	S	102. 9	S
66.30	S	106. 0	S
66. 5	S	103. 0	S
67. 0	S	102. 6	S
66.14	S	105. 0	S
65. 7	S	Mean = 104.71	
65.32	S	Z = − 1.19	
65.40	H	103.52	
65. 3	H		
64.22	H		
Mean = 65.21			

Position = $65^\circ.21'$ *sp*
Distance = $32''.693$

The stars described in Sir W. HERSCHEL'S Catalogue of 1785, under the names 52 and 56 of the 5th class, are one and the same; the estimated angle being about 60° *sp*, and the distance by a single good measure of Jan. 30, 1782, $32''.65$, agreeing precisely with our own.

1821.23. Position 64° 0′ *sp*. STRUVE, Dorpat Obs. iii. 135.

No. LXXI. R. A. 6h 20m; Decl. 6° 55′ S.

11 Monocerotis; Struve 228; I. 10;

Quadruple; a beautiful object; but properly only triple; the 4th star being too distant. A of the 7th, B the 8th, and C of the 8½ magnitudes. The distant star D is of the 10th magnitude.

Feb. 5, 1822.

Five-feet Equatorial.

Measures of AB

sf

Position. ° ° ′		Distance. Parts.	
90—49.45	H	21. 8	H
50. 2	H	19. 9	H
51. 4	H	20. 5	H
50. 1	H	21. 9	H
51.28	H	22. 8	S
51.30	S	22. 3	S
51. 0	S	20. 9	S
50.30	S	21. 8	S
50.12	S		
49.42	S		
Mean = — 50.31		Mean = 21.49	
		Z = + 0.24	
		21.73	

Position = 39°.29′ *sf*

Distance = 6″.862.

Measures of BC

sf

Position. ° ° ′		Distance. Parts.	
90—80.30	S	10. 4	S
79.24	S	9. 9	S
79. 0	S	10. 0	S
80.29	S	10. 4	S
79.52	S	10. 6	H
78.10	H	11. 0	H
79.11	H	9. 1	H
80.10	H	9. 2	H
78. 0	H	9. 7	H
78.30	H		
79.10	H		
Mean = — 79.19		Mean = 10.03	
		Z = + 0.24	
		10.27	

Position = 10°.41′ *sf*

Distance = 3″.243

Distant Star.

Angle of Position = 67° 20′ *np* (single measure.)

Sir W. Herschel's measures of the positions of these stars are,

Position of AC, Oct. 20, 1781, 31° 38′ *sf*; H. Cat. of 1782.

BC, Oct. 20, 1781, 11° 32′ *sf*; ditto.

Mar. 4, 1802, 11° 30′ *sf*; MS. very accurate.

11 Monocerotis continued.

The position of AC may be calculated from our measures, and comes out 30° 30′, agreeing nearly with the above, so that this star appears to have preserved its fixity completely.

Position of AB 46° 36 *sf* } STRUVE, Dorpat Obs. vol. iii. 132.
BC 6° 1′ *sf* }

No. LXXII. R. A. $6^h\ 22^m$; Decl. 17° 54′ N.

20 Geminorum; STRUVE 230; IV. 46;

Pretty unequal.

Jan. 17, 1822.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.	
59.30	H	61. 5	H
60.18	H	60. 9	H
60.20	H	62. 8	H
60.30	H	60. 0	H
61.12	H	62. 2	S
62. 0	S	62. 4	S
61.49	S	62. 2	S
61.14	S	62. 5	S
61.41	S	63. 0	S
61.58	S		
Mean = 61. 3		Mean = 61.94	
		Z = − 0.34	
		61.60	

Position = 61°.3′ *sp*
Distance = 19″.454

No. LXXIII. R. A. $6^h\ 29^m$; Decl. 18° 31′ S.

ν Canis Majoris; STRUVE 237; IV. 81.

Large reddish white; small bluish.

March 22, 1821.

sp

Position. ° ′		Distance. Parts.	
9.50	H	54. 0	H
11.30	H	54. 0	H
9. 5	H	56. 0	H
Mean = 10. 8		Mean = 54.67	
		Z = − 0.08	
		54.59	

Position = 10°.8′ *sp*
Distance = 17″.240

ν Canis Majoris continued.

This star has undergone an obvious and considerable change in position, and perhaps a slight one in distance since 1782; the measure taken in that year being 18″.32, and the position being called "almost directly preceding" (Sep. 30), and "very near directly preceding" (Dec. 31); expressions irreconcileable with a deviation of 10° from the parallel.

No. LXXIV. R. A. $6^h\ 30^m$; Decl. 59° 37′ N.

12 Lyncis; STRUVE 239; I. 6 and III. 22;

Triple A of the 7th magnitude. B of the $7\frac{1}{2}$. C of the 9th magnitude. A and B very close. The distant star C is decidedly blue.

Position.	March 22, 1821.	Distance. Parts.
° ′	Measures of AC.	
34.14 H	*np*	33. 2 H
38.48 H		33. 5 H
37.27 H	Position = 37°.16′ *np*	32. 3 H
38.22 S	Distance = 10″.099.	31. 3 S
38.19 H		30. 0 H
36.27 H		
Mean = 37.16		Mean = 32.06
		Z = − 0.08
		31.98

Position.	April 7, 1823.	Distance. Parts.
° ° ′	Five-feet Equatorial.	
90—53.30 S	*np*	30. 9 S
51.45 S		29. 0 S
54.25 S	Position = 36° 20′ *np*	30. 5 S
55. 0 S	Distance = 9″.721.	29. 5 S
53.40 S		31. 5 S
		32. 2 S
		30. 2 S
Mean = — 53.40		Mean = 30.54
		Z = + 0.24
		30.78

12 Lyncis continued.

April 11, 1823.

Five-feet Equatorial.

Measures of AB.

sf

Position. ° ° ′	
90—22.45	S
21.25	S
24. 7	S
25. 5	S
24. 9	S
25. 5	S
17.38	H
18.15	H
20.15	H
20. 5	H
20. 5	H
18. 6	H
22.35	H
18.38	H
19. 7	H
23.25	S
22.35	S
21. 5	S
Mean = — 21.21	

Position = 68°.39′ *sf*

Distance = 2″.593

Distance. Parts.	
7. 3	H
8. 7	H
9. 5	H
9. 8	H
9. 1	H
8. 0	S
9. 9	S
8. 8	S
10. 0	S
9. 0	S
Mean = 9.01	
Z = — 0.73	
8.21	

April 11, 1823.

Five-feet Equatorial.

Measures of AC.

np

Position. ° ° ′	
90—53.55	S
53.58	S
54.25	S
52. 9	H
51.35	H
53. 6	H
Mean = — 53.11	

Position = 36°.49′ *np*

Measures of these stars very difficult in consequence of the star B's situation relative to A.

Mean result.

Position of AB	68° 39′ *sf*.	Distance 2″.593.	Epoch 1823.28
AC	36° 50′ *np*	9″.849.	1822.59

The position of the nearer stars has sustained a remarkable change, while that of the more distant has scarcely altered; the measures taken May 15, 1782, giving as follows:

Position of AB 88° 37′ *sp*
AC 32° 33′ Distance 9″.38 } H. Cat. of 1782.

This star therefore deserves particular attention. The angle

12 Lyncis continued.

described in 40.81 years amounting to no less than 22°.74; giving an annual angular motion of —0°.5574 in the direction *np sf* or retrograde. Should this continue uniform, the lapse of 57 years will bring the three stars into one straight line, and in 646 years a complete revolution will have been performed. M. STRUVE's measures are

1821.32; Position of AB 69° 42′ *sf*; AC 34° 12′ *np*; } STRUVE, Dorpat Obs. iii. 364.

No. LXXV. R. A 6^h 34^m; Decl. 43° 45′ N.

56 Aurigæ; STRUVE 244; V. 107;

Double; considerably unequal; large white; small blue; 6th and 9th magnitudes.

Position. ° ′	March 11, 1823.	Distance. Parts.
71.55	Five-feet Equatorial.	177.2
74.0	*nf*	176.2
74.20		175.0
72.45		180.0 } S
72.15 } S	Position = 72°.52′ *nf*	176.5
72.10	Distance = 55″.386	176.2
73.0		176.5
72.20		Mean = 176.80
73.5		Z = − 1.43
Mean = 72 52		175.37

The above measure is corroborated by a single measure taken Feb. 11, 1823, which gave 73° *nf* (S).

The measures of this star taken in 1783 give

Position 72° 36′ *nf*. Distance 52″.95. H. Cat. of 1785.

No. LXXVI. R. A. $6^h\ 44^m$; Decl. $13^\circ\ 24'$ N.

38 Geminorum; STRUVE 250; III. 47;

Extremely unequal; large white; small bluish;

March 19, 1821.

sf

Position $= 86^\circ.47'$ *sf*

Distance $= 6''.698$

Position.		Distance. Parts.	
° ′			
87. 7	H	25. 0	H
86.53	H	22. 8	H
86.22	H	25. 3	H
Mean = 86.47		Mean = 24.37	
		Z = − 3.16	
		21.21	

Feb. 3, 1822.

Five-feet Equatorial.

sf

Position $= 83^\circ.45'$ *sf*

Distance $= 5''.523$.

Position.		Distance. Parts.	
° ° ′			
90—4.50	H	17. 8	H
7.43	H	19. 2	H
7. 1	H	18. 1	H
6.58	H	18. 0	H
6.24	S	19. 8	S
6. 0	S	19. 2	S
5.45	S	19. 5	S
5.17	S	18. 3	S
		18. 1	S
Mean = —6.15		Mean = 18.67	
		Z = − 1.19	
		17.48	

The measures of this star would be attended with excessive difficulty, except in such a night as the present; it is one of rare occurrence. Moon nearly full. Small star appears a beautiful point; large one quite free from bur or flare.

April 2, 1823.

Five-feet Equatorial.

sf

Position $= 85^\circ.57'$ *sf*

Distance $= 5''.536$

Position.		Distance. Parts.	
° ° ′			
90—4.40	S	21. 0	S
4. 0	S	20. 0	S
4.50	S	19. 0	S
3.30	S	20. 8	S
3.35	S	20. 0	S
3.42	S		
Mean = — 4. 3		Mean = 20.16	
		Z = — 2.63	
		17.53	

38 Geminorum continued.

This star to night admirably defined; the measures were gotten with a power of 133, with the greatest facility.

Mean result.

Position 84° 24′ *sf.* Distance 5″.528. Epoch 1822.67.

The observations of March 19, 1821, are rejected in taking the mean.

Other measures of this star are,

Position 89° 54′ *sf* (H. Cat. 1785). Dist. 7″.95. H. MS. 1783, mean of 3.

86° 6′ *sp* H. Account of changes, &c. April 6, 1802.

86° 18′ *sf* STRUVE; Additamenta, p. 184, Mar. 22, 1820.

With regard to the angle, a slight change may still be suspected, but the diminution of distance is not to be doubted, even should the rejected observations of March 19, be the true ones.

No. LXXVII. R. A. 6^h 53^m; Decl. 20° 50′ N.

ζ Geminorum; STRUVE 254; VI. 9.

Double; large yellow; small ash colour.

Position.		March 24, 1821.	Distance. Parts.	
° ′		*np*		
85. 1	H		288. 5	H
85.14	H		290. 7	H
85.40	H		290. 2	H
85.14	S	Position = 85°.27′ *np*	293. 0	S
85.50	S	Distance = 1′.31″032	294. 0	S
85.46	S		292. 0	S
Mean = 85.27			Mean = 291. 4	
			Z = — 3.16	
			288.24	

The measures of Sir W. HERSCHEL are,

Position 81° 14′ *np.* Distance 1′.31″.86; 1781.83.

The angle of position appears to have increased, as an error of 4° could hardly be committed in the measure of so distant a star.

No. LXXVIII. R. A. $7^h\ 8^m$; Decl. $55° 37'$ N.

19 Lyncis; STRUVE 257; III. 83;

Triple;

Measures of AB.
March 22, 1821.
sp

Position.		Distance. Parts.	
° ′			
42.50	H	47. 5	H
41.52	H	46. 9	H
43.20	H	48. 5	H
43.50	S	43. 9	S
43. 2	S	46. 2	S
43.36	S	45. 0	S
		44. 9	S
Mean = 43. 5		Mean = 46.13	
		Z = − 0.08	
		46.05	

Position $= 43°.5'$ *sp*

Distance $= 14''.544$

Measures of AC.
March 22, 1821.
sf

Position.		Distance. Parts.	
° ′			
86.30	H	674. 1	H
86. 3	H	677. 2	H
87. 6	H	677. 7	H
87.30	S	673. 8	S
86.51	S	677. 5	S
86.30	S	672. 2	S
		677. 0	S
Mean = 86.45		Mean = 675.64	
		Z = − 0.08	
		675.56	

Position $= 86°.45'$

Distance $= 3'.33''.357$

Others measures of this star* are

AB, Position $46° 54'$ *sp*. Distance $14''.19$. H. Cat. of 1785.
$50° 4'$ *np*. (1814). $14''.90$. STRUVE Addit. 50.
$42° 27'$ *np*. STRUVE. Dorpat Obs. iii. 361, 1821.31.

The angle $50° 4'$ is deduced by STRUVE from two assumed or estimated proportions between the differences of R. A. and Decl.

* BODE, we know not on what authority, has set down the distance of this star at $7''$.

No. LXXIX. R. A. $7^h\ 9^m$; Decl. $50^\circ\ 27'$ N.

20 Lyncis; Struve 258; 61 of the 145;

Double; as nearly equal as possible; 7th and $7\frac{1}{8}$th magnitudes.

April 27, 1823.

Five-feet Equatorial.

sp

Position.		Distance. Parts	
° ′			
18.50	S	49. 2	S
17. 6		53. 5	
18.45		48. 8	
19.20		50. 5	
17. 5		50. 2	
16.28		48. 0	
Mean = 17.56		Mean = 50.03	
		Z = + 0.14	
		50.17	

Position = 17°. 56′ *sp*

Distance = 15″.845

May 4, 1823.

Five-feet Equatorial.

sp

7 and $7\frac{1}{10}$ magnitudes.

Position.		Distance. Parts.	
° ′			
15. 0	H	49. 4	H
16.33		51. 6	
17.20		53. 0	
18. 0		51. 1	
17.25		50. 0	
16.50			
16.50			
Mean = 16.51		Mean = 51.02	
		Z = − 0.01	
		51.01	

Position = 16°.51′ *sp*

Distance = 16″.110.

Mean result.

Position 17° 21′ *sp*. Distance 16″.988. Epoch 1823.33.

1821.32 19° 36′ *sp*. Struve, Dorpat Obs. iii. p. 364.

No. LXXX. R. A. $7^h\ 9^m$; Decl. 22° 18′ N.

δ Geminorum; STRUVE 259; II. 27;

Double; excessively unequal; large white; small blue; the star exquisitively defined, otherwise the measures would be exceedingly difficult; 3d and 12th or 15th magnitudes.

Position.	Feb. 21, 1822.	Distance. Parts.
° ′	Five-feet Equatorial.	
75.38 H	*sp*	22. 7 H
73.30 H		21. 5 H
73. 0 H		25. 0 H
74.28 H		23. 8 H
74.52 H		24. 3 S
75.30 S	Position = 74°.35′ *sp*	24. 0 S
75.10 S	Distance = 7″.248	23. 8 S
74.48 S		23. 3 S
74.19 S		
Mean = 74.35		Mean = 23.55
		Z = − 0.60
		22.95

Other measures of this star are,

1781. 9 Position 85° 51′ *sp*; H. Catalogue of 1782.

1802.75 73 6 *sp*; H. Account of changes, &c. mean of 3 measures in 1802 and 1804.

1821.00 73 12 *sp*; STRUVE; Dor. Obs. iii. Distance = 7″.415 from △ decl. = 7″.10 (Observatio Egregie certa).

The extreme minuteness of the small star and its proximity to the large one, is obviously the reason of so discordant a series of observations. It is one of the most difficult stars in the heavens.

No. LXXXI. R. A. $7^h\ 23^m$; Decl. $32^\circ\ 17'$ N.

Castor; Struve 266; II. 1;

3rd and 4th magnitudes.

March 13, 1821.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.	
0.49	H	21. 5	H
4.25	H	19. 8	H
3.26	H	21. 0	H
0.15	S	19. 0	S
5.30	S	22. 0	S
5.40	S	19. 5	S
Mean = 3.21		Mean = 20.47	
		Z = − 3.16	
		17.31	

Position $= 3^\circ.21'$ *sp*

Distance $= 5''.467$

March 17, 1821.

Five-feet Equatorial.

Position. ° ′		Distance. Parts.	
1.30	S	21. 4	S
1. 5	S	22. 5	S
4. 0	S	20. 8	S
1.15	S	20. 0	S
4.20	S	22. 0	S
Mean = 2.26		Mean = 21.34	
		Z = − 3.16	
		18.18	

Position $= 2^\circ.26'$ *sp*

Distance $= 5''743$

These observations were made by daylight between $4^h\ 25^m$ and $5^h\ 1^m$ ST.

March 25, 1821.

sp

Position. ° ′	
1. 4	H
2.40	H
3.28	H
3.15	H
2.56	S
2.28	S
2. 2	S
1.53	H
4.31	S
4. 2	S
4.16	S
1.49	H
Mean = 2.52	

Position $2^\circ.52'$ *sp*

Castor continued.

Feb. 3, 1822.

Five-feet Equatorial.

Distance. Parts.		Distance. Parts.		Distance. Parts.	
17.0	S with 381	20.5	S with 303	17. 5	S with 381
16.7		19.4		18. 0	
17.1		19.5		18. 8	
18.0		19.0		18. 5	
17.9		19.1		19. 3	
16.1					
				Mean = 18.27	
				Z = − 1.19	
				17.08	

Distance 5″.394.

Five-feet Equatorial. Feb. 11, 1823.

The evening being very unfavourable for procuring satisfactory measures of double stars generally, in consequence of the uniform diffusion of thin clouds, which gave to the stars of the 1st and 2d magnitudes the appearance of being only of the 3rd and 4th, the instrument was directed to Castor when it was half an hour west of the meridian: the two stars were admirably defined, perfectly steady, without concentric rings, and of the 5th and 6th magnitudes only, and the following angles were gotten; they were highly satisfactory.

Feb. 11, 1823.

Position. ° ′	
6.30	S
4.52	
4.50	
6.40	
5.30	
6.21	
6. 0	
6. 8	
5.36	
6.22	
5.54	
5.11	
4.47	
Mean = 5.45	

Position = 5°.45′ *sp*

Feb. 12, 1823.

Position. ° ′	
5.10	H
3.37	
4. 1	
4.15	
5. 0	
3.46	
3.45	
4.30	
4.42	
5. 8	
3.18	
4. 0	
4.48	
Mean = 4.18	

Five-feet Equatorial.

Position = 4°.18 *sp*
Distance = 5″.030

Distance. Parts.	
16. 1	H
17. 0	
17. 5	
16. 0	
16. 9	
17. 5	S
17. 7	
18. 1	
18. 0	
17. 8	
Mean = 17.26	
Z = − 1.33	
15.93	

Castor continued.

Mean result.

Position (by the observations of 1821) 2° 53′ *sp*; 1821.21 mean date.
By those of 1823 5 1 *sp*; 1823.11 ditto.
Distance by all the observations 5″.355; 1822.10.

The observations of this star as given by different astronomers may be arranged as follows:

Position.

1759.80	56°. 5 *np*.	Bradley and Maskelyne, cited by Sir W. Herschel "Account, &c."
1779.84	32.79 *np*.	H. "Account of the Changes, &c. 1803."
1791.64	25.10 *np*.	H. ditto, ditto. Mean of two measures, 1791, 1792.
1795.96	13.90 *np*.	Ditto, ditto, single measure.
1802.04	11.36 *np*.	Ditto, ditto, mean of 9 measures, Phil. Trans. 1803, p. 365.
1813.83	2.86 *np*.	Struve, by projection micrometer. Dorpat Obs. Cat. ii. 50.
1816.97	0.00 *p*.	Herschel, Junr. Seven-feet reflector. Slough.
1819.10	0.40 *sp*.	Struve; Additamenta, &c. p. 176.
1821.21	2.88 *sp*.	H. and S. ut supra, 24 measures.
1823.11	5.02 *sp*.	H. and S. ut supra, 26 measures.

To these we may add

1820.66	2.34 *sp*.	Struve, Dorpat Observations, iii. by 42 measures.
1780.43	5″290	Sir W. H. (MS.) Mean of six measures taken between 1779.84 and 1781.16. From what source the measure 5″.156 in the Catal. of 1782 was derived, does not appear.
1819.10	5 480.	Struve, Additamenta, &c. page 176.
1822.10	5 355.	H. and S. ut supra, mean of 37 measures.

That this beautiful double star is truly characterized by Sir W. Herschel as a binary system, there can now be no doubt. In 63.3 years the change of the angle of position amounts to 61°.5, being on the average 0°.971 per annum. The mean angular velocity, computed from the *ensemble* of the above observations, giving them all equal weight, is 0°.965. Meanwhile the distance continues precisely what it was. This would indicate a circular orbit at right angles to the line of

Castor continued.

sight; but it is most probable that the orbit is elliptic, and merely projected into a circle; for if we examine the foregoing angles attentively, we shall find that the angular velocity is sensibly retarded; for, in the period of 20.0 years elapsed between the observations of 1759 and 1779, we find an angle of 23°.7 described, being 1°.185 per annum. In the next period of 22.2 years to the measures of 1802 (which from the number taken may be relied on), 21°.4 only were described, giving an angular velocity of 0°.964, or about the average; while in the third (and probably most accurate) period of 21.1 years, only 16°.4 were described, giving an angular velocity of 0°.777 per annum, being as much below the average as that of the first 20 years is above it.

R.A. $7^h 23^m$. Castor and the faint distant stars. Decl. 32° 17′ N.

South following and south preceding Castor are two minute stars C and D, the former about one-third the distance of the latter from A, the large star forming Castor. C may be called of the 14th; D the 15th or perhaps the 16th; C bears a tolerable illumination; D scarcely any.

The measures of AC tolerably good; those of AD perhaps a little inaccurate.

Feb. 14, 1823.
Seven-feet Equatorial.
Measures of AC
sf

Position. ° ° ′	Distance. Parts.
90—19.35	293. 0
19.40	290. 3
18.50	291. 0
18.45	294. 3
17.20	292. 8
17.20	293. 0
17.40	
17.45	
19.15	
19. 0	
Mean = — 18.31	Mean = 292.40
	Z = — 0.52
	291.88

Position = 71°.29′ *sf*

Distance = 1′.10″180.

Castor continued.

Position.		Distance. Parts.
° ′	Measures of AD	
45.37	*sp*	905. 0 S
45.48		902. 0
45.15 S	Position $= 45°.45$ *sp*	
46.10		Mean $=$ 903.50
45.53	Distance $= 3'.17''.114$	Z $= -$ 0.52
Mean $=$ 45.45		902.98

Position.		
° ° ′	Feb. 19, 1822.	
90—18.35 S	Five-feet Equatorial.	Position $= 71°.59'$ *sf*
17.28	Measures of AC	
Mean $= -$ 18. 1	*sf*	

Of AD no measures can be procured with the five feet. Evening at times very favourable. (S)

Mean result.

AC	Position 71° 34 *sf*;	Distance 1′.10″.180
AD	45 45 *sp*	3 17 .114.

1820.75. Position of AC 72° 36′ *sf*; Struve, Dorp. Obs. iii.

No. LXXXII. R. A. $7^h\ 31^m$; Decl. $5°\ 43'$ N

31 (Bode) Canis Minoris; Struve 269; I. 23.

Excessively close; nearly equal; a miniature of η Coronæ Borealis (allowance being made for difference of quadrant), but smaller, and much more difficult to separate. Of the 10th or 10½th magnitudes. A power of 133 the usual observing power of the Five-feet Equatorial, gives no suspicion of its being double. The observations made with 303 which just separates their discs.

Position.	
° ° ′	Feb. 19, 1823.
90—48.10	Five-feet Equatorial.
54. 0 S	*sf*
48.20	
49. 0	Position $= 40°.8'$ *sf*
Mean $= -$ 49.52	

31 (BODE) Canis Minoris continued.

Position.	Seven-feet Equatorial.
° ° ′	
90—53.15 } S	same date
53.20	*sf*
54. 0	
52.40	Position = 36°.41′ *sf*
Mean = — 53.19	

There are several other small stars in the field; to settle the place of 31 therefore, the following differences of declination and right ascension with Procyon were taken.

Diff. of Decl. Parts.	Five feet Equatorial.	Dif. of R. A. in Time. ″
454. 8 } S	On the limb of the instrument.	40. 5 } S
456. 8	Dif. of decl. Procyon north of 31.	40. 8
Mean = 455.80	On the limb 2′.24″.0	Mean = 40.65
Z = — 2.29	By the microm. 2 23 .229	
453.51	Dif. of R. A. 0 40 .65 (in Time.)	
	(Procyon preceding)	

Position.	Seven-feet Equatorial.
° ° ′	
90—57. 0 } H	Feb. 21, 1823.
56. 1	*sf*
58.30	
53. 1	Position = 35°.6′ *sf*
50. 0	
Mean = — 54.54	Mean Position 37° 8′ *sf*.

Other measures of this star are

Position 1781, Nov. 28. 27° 21′ *sf*. H. Catalogue of 1782.
1820.28; 38 15 *np* (or *sf*) STRUVE, Additamenta, 184.
1820.79; 40 46 *np*; Dist. 1″ or $1\frac{1}{2}$″; STRUVE, Dorp. iii.

If the first measure be correct, the position has changed nearly 10°.

No. LXXXIII. R. A. $7^h\ 36'$; Decl. $33^\circ.51'$ N.

π Geminorum; STRUVE 275; IV. 53;

Excessively unequal; 5th and 15th magnitudes.

Position.	Feb. 21, 1823.	
° ′	Seven-feet Equatorial.	No measure of distance can be obtained; not less than 400 parts. (H)
90—20.13	*np*	$Z = -$ 0.52
20.59	Position $= 70^\circ.43$ *np*	399.48
19.35 H	Distance $= 1'.36''.051$	
18.37		
17. 0		
Mean $= -$ 19.17		

Position.	March 11, 1823.	
° ° ′	Seven.feet Equatorial.	Parts.
90—22. 0	*np*	381. 0 ± S
19.30	Position $= 69^\circ.22'$ *np*	$Z = +$ 1.29
19. 0	Distance $= 1'.31''.918$	382.29
20.25 S	Very unsatisfactory. The angles tolerably good. The evening being beautiful. (S).	
21. 0		
21.30		
21. 0		
Mean $= -$ 20.38		

Mean result.

Position $69^\circ\ 55'$ *np*; Distance $1'.33''.984$ 1823.16

The small star measured here is not that whose distance ($21''\ 30'''$) is given in the Catalogue of 1785, which could not be seen. That seen by us is the *minimum visibile* in the telescope of the seven-feet equatorial.

No. LXXXIV. R. A. $7^h\ 37^m$; Decl. $14^\circ\ 15'$ S

2 Argo Navis; STRUVE 278; IV. 91.

Double; a little unequal.

Jan. 17, 1822.

Five-feet Equatorial.

np

Position $= 69^\circ.27'$ *np*

Distance $= 19''.660$

Position.		Distance. Parts.	
° ° ′			
90—19.24	H	61. 4	H
20.46	H	64. 5	H
20.47	H	61. 0	H
20.40	H	62. 1	H
21. 0	S	63. 1	H
20.43	S	63. 2	S
20.30	S	63. 2	S
20.37	S	61. 5	S
		63. 1	S
		62. 8	S
Mean = — 20.33		Mean = 62.59	
		Z = — 0.34	
		62.25	

Another bright star in the field, *nf*

Sir WILLIAM HERSCHEL, in his paper of 1785, makes the angle of position 69°.12 (Feb. 19, 1783), and the distance 17″.38. The distance, therefore, seems to have undergone a sensible increase.

No. LXXXV. R. A. $7^h\ 38^m$; Decl. $18^\circ\ 47'$ N.

201 (BODE) Gemini; STRUVE 280; II. 64.

Double; very unequal; large white, small blue decidedly. 6th or 7th and 9th magnitudes, but cloudy.

Feb. 5, 1822.

Five-feet Equatorial.

sp

Position $= 0^\circ.0'.10''$ *sp*

Distance $= 6''.613$

Position.		Distance. Parts.	
° ° ′			
90—0.14	H *np*	19. 0	H
—0.25	H *np*	21. 4	H
—0.14	H *np*	20. 4	H
+0. 7	S *sp*	20. 2	H
+0.30	S *sp*	21. 4	S
+0.17	S *sp*	21. 9	S
		19. 5	S
		21. 8	S
Mean = +0.0.10″		Mean = 20.70	
		Z = + 0.24	
		20.94	

201 (Bode) Gemini continued.

According to a measure of Sir William Herschel in 1783, the position was 4°.9′ *np*; but in an observation of October 13, 1782, we find Position a few degrees *sp*; and in a sweep, Feb. 22, 1789, it is called "almost directly preceding;" Distance in 1783, above 3 diameters of L. This star therefore has undergone no change in either respect.

1821.27. Position 7°.6′ *np*. Mean of 6 measures. Struve, Dorp. iii.

The difference between our position and that observed by M. Struve is enormous. To set the question between us at rest, the following additional measures were taken:

Nov. 13, 1823.
Five feet Equatorial.
sp
Position = 0°.18′ *sp*
Distance = 5″.928
Large Star yellowish.
Small decidedly blue.
6.7th and 8.9th magnitudes.

Position. ° ′		Distance. Parts.	
+0.30 *sp*	H	20. 5	H
−0.30	H	19. 9	H
+0. 3	H	21. 3	H
+0.15	H	22. 0	H
−0.10	H	21. 5	H
+0.55 *sp*	S	19. 3	S
−0. 5	S	18. 7	S
+1. 0	S	20. 5	S
+0.20	S	19. 8	S
+0.42	S	18. 7	S
Mean = +0.18		Mean = 20.22	
		Z = − 1.45	
		18.77	

The position wire being set to + 7° and to − 7°, both observers declared the angles to be intolerably erroneous, and about equally so either way. The star was about 3 hours from the meridian. This renders the measures of distance liable to some suspicion, and of course the others must be preferred, or at least be allowed double weight. This done, our mean result will stand as follows:

Position 0°.9′ *sp*; Distance 6″.384; Epoch 1822.89.

No. LXXXVI. R. A. $7^h\ 46^m$; Decl. $63°\ 34$ N.

2 (BODE) Ursæ Majoris ? 1780.384; STRUVE 282.

7th and 8th magnitudes.

Feb. 23, 1823.

Five-feet Equatorial.

n f

Position.		Distance. Parts.	
° ′			
6.19	H	152.4	H
6.40	H	150.0	H
7. 3	H	151.1	H
6.16	H	152.5	H
7. 4	H	149.1	H
7.12	S	151.5	S
6.43	S	150.7	S
7. 7	S	150.2	S
6.55	S	149.2	S
6.37	S	150.1	S
Mean = 6.48		Mean = 150.68	
		Z = − 2.98	
		147.70	

Position = 6° 48′ *n f*

Distance = 46″.647

No. LXXXVII. R. A. $7^h\ 49^m$; Decl. $2°\ 47'$ N.

14 Canis Minoris; STRUVE 283. VI. 84.

Triple; 1 and 2 very unequal; 1 and 3 extremely unequal; 1 = 6th, 2 = 9th, 3 = 10th magnitudes.

The measures very difficult, but taken with great care.

Feb. 22, 1822.

Five-feet Equatorial.

Measures of 1 and 2

nf

Position.		Distance. Parts.	
° ′			
24.34	H	243. 5	H
25.12	H	243. 3	H
24.37	H	240. 2	H
24.43	H	240. 6	S
24. 0	S	241. 5	S
23.15	S	242. 0	S
23.42	S		
Mean = 24.18		Mean = 241.85	
		Z = − 1.14	
		240.71	

Position = 24° 18′ *nf*

Distance = 1′ 16″.021

Measures of 1 and 3

sf

Position = 62° 50′ *sf*; Distance = 1′ 52″.168 single measures (S).

14 Canis Minoris continued.

Sir WILLIAM HERSCHEL's measures of 1 and 2 are,

Position 26° 24′ *nf*; Distance 1′ 5″.46.

The increase of distance is very remarkable, and indicates a considerable proper motion in one or other of the stars.

No. LXXXVIII. R. A. $7^h\ 58^m$; Decl. 28° 0′ N.

11 Cancri; STRUVE 287; I. 11.

Double; rather unequal.

Feb. 14, 1822.

Five-feet Equatorial.

np

Position. ° ° ′		Distance. Parts.	
90—6.30	H	15. 2	H
6.43	H	15. 1	H
5.33	H	14. 8	H
5. 0	H	13. 5	H
5. 0	S	16. 0	S
5. 5	S	15. 3	S
4.35	S	13. 3	S
5.41	S	15. 2	S
5.28	S	14. 4	S
5.21	S	15. 0	S
Mean = —5.30		Mean = 14.58	
		Z = — 0.34	
		14.24	

Position = 84° 30′ *np*

Distance = 4″.498

Sir WILLIAM HERSCHEL's measures gave him,

Position 85° 10′ *np*; Distance $1\frac{3}{4}$ diameter. April 15, 1782.

No. LXXXIX. R. A. $8^h\ 0^m$; Decl. 2° 28′ S.

29 Monocerotis; STRUVE 288; IV. 97.

March 14, 1821.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
25.35	H	228. 0	H
26. 0	H	213. 0	H
26.30	H	213. 0	H
26.45	H	225. 0	H
28. 4	S	206. 1	S
28. 6	S	210. 5	S
28. 5	S	201. 0	S
Mean = 27. 1		Mean = 213.80	
		Z = − 3.16	
		210.64	

Position = 27° 1′ *sp*

Distance = 1′.6″.524

The small star exceedingly faint, and will scarcely bear any illumination.

A third star nearly in the same line *sp*, and at 3 times the distance.

Feb. 22, 1822.

Five-feet Equatorial.

Position of distant star with the large one, *sp*.		Distance. Parts.	
° ′		210. 0	H
30.22	H	212. 7	H
30.10	S	212. 3	H
Mean = 30.16		210. 2	H
		210. 8	S
		211. 3	S
		212. 9	S
		213. 0	S
		Mean = 211.65	
		Z = − 1.14	
		210.51	

*Position = 30° 16′ *sp*

*Distance = 1′.6″.483

* The angle is that of the farther star; the distance of the nearer one, which is blue, and bears a much better illumination than the other, which is dusky white.

Mean result.

A.B. Position 27° 1′ *sp*; Distance 1′.6″.503; 1821.20.

A.C. 30 16 *sp*.

If this star be the same with IV. 97, the small star seen and measured by Sir W. HERSCHEL has escaped detection with our instruments. Vide Cat. of 1785.

No. XC. R. A. $8^h\ 2^m$; Decl. 18° 11′ N.

ζ Cancri; Struve 289; III. 19.

Double; pretty unequal; is not to be seen triple, although beautifully defined and round.

Feb. 21, 1822.

Five-feet Equatorial.

sf

Position.		Distance. Parts.	
° ° ′			
90—22. 0	H	21. 0	H
21.30		19. 6	
22. 1		18. 9	
20.29		18. 2	
22. 5		19. 0	
20.58		22. 1	S
22. 6	S	21. 8	
22.11		21. 1	
21.51		20. 5	
21.56		21. 4	
21.47			
Mean = —21.43		Mean = 20.36	
		Z = — 0.60	
		19.76	

Position = 68° 17′ *sf*
Distance = 6″.241

The series of observations of this remarkable star is as follows:

Position.		Distance.	
88° 16′ *sp*	1781.89;	8″.046, 1780;	H. Catal. of 1782.
81 47 *sf*	1802.11;		H. account of changes, &c.
71 21 *sf*	1820.29;		Struve, Additamenta, &c.
70 1 *sf*	1821.07;	5 .714 from △ decl. 5″.37;	Struve, Dorp. Obs. iii.
68 17 *sf*	1822.14;		H. Jun. and S. as above.

In 40.25 years then the change of angle amounts to 23°42′, which is at the mean rate of —0°.5813 per annum, in the direction *np sf*, or retrograde. The change of position has also been accompanied with a considerable diminution of distance; and further observations must decide whether this is the result of rectilinear or orbitual motion. If the former,

the minimum of distance will be attained in about 40 years from the present time, and the change during that period much less rapid than heretofore. On the other hand, an orbitual motion will be indicated by the distance continuing to diminish beyond that limit, and probably too by an acceleration in the angular motion. A certain acceleration indeed is already perceptible, 10° having been described in the first twenty years, and 13°½ in the last; but no great reliance is to be placed on this, as the earlier measures depend only on single observations. Meanwhile the change remarked by Sir W. HERSCHEL in his paper of 1804, is fully confirmed both by M. STRUVE'S observations and our own.

No. XCI. R. A. $8^h\ 8^m$; Decl. 12° 24′ S;

19 Argo Navis; STRUVE 291; (Nova):

Double; 4th and 10th magnitudes; large white; small dusky:

Feb. 5, 1822.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.	
14.57	H	222. 5	H
13.24	H	222. 7	H
14.29	H	220. 2	H
13.20	H	227. 0	H
Mean = 14. 2		Mean = 223.10	
		Z = + 0.24	
		223.34	

Position = 14°.2′ *sp*

Distance = 1′.10″.536

March 22, 1823.

Five-feet Equatorial.

5th and 10th magnitudes

sp

Position. ° ′		Distance. Parts.	
13.40	S	221. 8	S
14.25	S	222. 5	S
14.10	S	223. 8	S
14.20	S	222. 5	S
13.45	S	223. 0	S
Mean = 14. 4		Mean = 222.72	
		Z = − 1.43	
		221.29	

Position = 14°.4′ *sp*

Distance = 1′.9″.887

19 Argo Navis continued.

Mean result

Position 14° 3′ *sp*. Distance 1′ 10″.175. 1822.65.

This star is erroneously called VI. 26, in STRUVE's Catalogue, the latter being the same with ε Sagittæ. Neither is it IV. 26, as in SOUTH's. A note of uncertainty is affixed to the designation of FLAMSTEED's number in the Catalogue of 1782, and the star there described is not the star whose place and measures are here set down.

No. XCII. R. A. 8^h 16^m; Decl. 25° 7′ N.

24 υ Cancri; STRUVE 298; II. 41;

Double; rather unequal; 7th and 8th magnitude;

Feb. 14, 1822.

Five-feet Equatorial.

nf

Position = 52°.13′ *nf*

Distance = 6″.046

Position. ° ′		Distance. Parts.	
52.10	H	21. 0	H
52.55	H	19. 0	H
52.32	H	19. 3	H
53. 0	H	20. 0	H
51.45	S	18. 9	S
52. 0	S	19. 5	S
51.35	S	19. 0	S
51.50	S	19. 4	S
		19. 2	S
Mean = 52.13		Mean = 19.48	
		Z = — 0.34	
		19.14	

This star appears to have undergone a great change both in angle and distance. Sir W. HERSCHEL, by the measure of Jan. 23, 1783, made the position 32°.9′ *nf*, and the interval only 1½ diameter of the large star, which can hardly (for stars of this magnitude) exceed 4″ distance from centre to centre. The angle described in 39.06 years is 20°.07, giving an annual angular motion of — 0°.514, being in the direction *n p s f* or retrograde.

24 υ Cancri continued.

Mr. Struve has determined the difference of declinations of the two stars composing this remarkable double star. His measure, reported in Zach's Correspondence Astron. viii. p. 370, was performed with a new wire micrometer by Fraunhofer, and gave for the result 4″.85. If we calculate the difference of declinations from our angle and distance given above, we find 4″.78 for its amount, differing only 0″.07 from Struve's.

1820.92. Position 55° 30′ *nf*; Struve, Dorpat Obs. iii; three night's observations.

No. XCIII. R. A. 8h 16′; Decl. 27° 31′ N.

φ ²Cancri; Struve 297; II. 40;

Double; equal;

Feb. 3, 1822.

Five-feet Equatorial.

sp or *nf*

Position. ° ′		Distance. Parts.	
57.30	H	20. 8	H
57. 0	H	16. 0	H
56.43	H	17. 0	H
56.47	H	16. 6	H
55.41	H	16. 1	H
60.15	S	21. 0	S
58.55	S	19. 8	S
57.15	S	19. 5	S
59. 6	S	19. 2	S
57.47	S	19. 2	S
60. 5	S		
59.15	S		
Mean = 58. 2		Mean = 18.52	
		Z = − 1.19	
		17.33	

Position = 58°.2′ *sp* or *nf*

Distance = 5″.473.

Feb. 21, 1822.

Five-feet Equatorial.

sp or *nf*

Position. ° ′		Distance. Parts.	
58.48	H	18. 5	H
57.15	H	17. 8	H
60. 0	H	18. 0	H
59.16	H	19. 7	S
59.18	S	18. 4	S
60.30	S	19. 3	S
60.20	S		
60.18	S		
Mean = 59.27		Mean = 18.62	
		Z = − 0.60	
		18.02	

Position = 59°.27′ *sp* or *nf*

Distance = 5.″691.

φ ²Cancri continued.

Distance.
Parts.

19. 0	S
18. 0	
18. 5	
17. 5	
18. 8	
19. 5	

Mean = 18.55
Z = − 1.43

17.12

March 11, 1823.

Five-feet Equatorial.

sp or *nf*

Distance = 5.″407.

March 15, 1823.

Five-feet Equatorial.

sp or *nf*

Position = 59°.25′ Mr. Richardson.

sp or *nf*

Position.

° ′	
58. 0	Mr. Richardson.
59.35	
58.20	
62.53	
58.14	
59.30	

Mean = 59.25

Mean result.

Position 58°.47′ *sp* or *nf*; Distance 5″.514; Epoch 1822.48.

Sir W. Herschel states the position of this star at 56°.42′ *nf*, and the distance of the discs 2 or 2½ diameters, which gives about 5 or 6″ for the distance of the centers. This star then has undergone no change.

1820.95 Position 53°.36′ *nf* } Struve, Dorpat Obs. iii. The mean is not taken, as
1821.23 58 42 *nf* } the first is undoubtedly erroneous.

No. XCIV. R. A. 8^h 26^m; Decl. 7° 15′ N.

18 (BODE) Hydræ; STRUVE 302; III. 49;

Double; pretty unequal; large yellowish; small bluish; A = 6th or 7th magnitudes, B = 8th. A third star is seen *sp* almost in a line with the other two, and distant about 2 minutes; it is of the 9th magnitude.

March 17, 1821.
Five-feet Equatorial.
Measures of AB
nf

Position. ° ′		Distance. Parts.	
68.10	H	37. 0	H
65.20	H	39. 5	H
67.30	H	39. 0	H
66.45	S	37. 1	S
67.50	S	39. 0	S
65.10	S	39. 7	S
Mean = 66.47		Mean = 38.55	
		Z = − 3.16	
		35.39	

Position = 66°.47′ *nf*
Distance = 11″.177

Feb. 5, 1822.
Five-feet Equatorial.
nf

Position. ° ′		Distance. Parts.	
67.13	H	35. 0	H
64.30	H	32. 5	H
64.17	H	32. 0	H
64.22	H	32. 3	H
64.49	H	33. 7	S
64.38	H	34. 3	S
63 45	H	33. 2	S
66.30	S	34. 4	S
66. 6	S	35. 0	S
67. 2	S	Mean = 33.60	
67. 9	S	Z = + 0.24	
66.50	S	33.84	
66.45	S		
66.30	S		
66. 0	S		
Mean = 66.46			

Position = 66°.46′ *nf*
Distance = 10″.688
Angle of the distant star = 56°.41′ *sp* (2 measures.)

Feb. 23, 1823.
Five feet Equatorial.
nf

Position. ° ′		Position. ° ′	
65. 0	S	63.32	H
64.32	S	63.54	H
65.58	S	63.35	H
66.50	S	62.54	H
65.32	S	62.50	H
66. 4	S		
Mean = 65.39		Mean = 63.19	

Position = 65°.39′ *nf*. S.
Position = 63°.19′ *nf*. H.

(18 Bode Hydræ) continued.

March 9, 1823.

Five-feet Equatorial.

nf

Position.		Position.	
° ′			
63.50	Mr. Troughton.	65.55	S
67.30		67.22	
63.55		67.11	
68.10		66.20	
68.55		67.30	
Mean = 66.28		Mean = 66.52	

Position = 66°.28′ *nf.* Mr. Troughton.
Position = 66°.52′ *nf.* (S.)

March 15, 1823.

Five-feet Equatorial.

nf

Position.	
° ′	
64.54	Mr. Richardson.
63.23	
63.28	
65.41	
63.38	
Mean = 64.13	

Angle = 64°.13′ *nf.* Mr. Richardson.

Mean result.

Position 65° 57′ *nf*, 1822.56. Distance 10″.844. 1821.64.

The measures of this star have furnished a curious instance of a constant difference between the observations of two observers; the one always observing angles above the mean, the other below it; and that not one night only, but after long intervals, without communication, &c. Occasionally each observer read off the other's measure, and each declared his eye offended by the situation of the micrometer wire as left by the other. The differences being found irreconcileable, other practised observers were called in to decide the point, whose measures, as will be seen, had no such effect. However the mean angle 65° 57′ here set down, being the result of 47 single measures, by four different observers, and on five nights, embracing an interval of two years, cannot well be erroneous to any extent.

Other observations of this star are as follows:

Position.	Distance.
62° 48′ *nf* 1783.34;	12″.5, 1783.10; H. Catalogue of 1785.
65 16′ *nf* 1802.17;	ditto MSS.
62 18′ *nf* 1821.90;	10″.097 from △ decl. = 8″.94 STRUVE, Dorpat Obs. iii.; two night's observations.

The very sensible diminution of distance between these stars may possibly be accompanied with a slight change in the angle.

No. XCV. R. A. 8h 36m; Decl. 29° 25′ N.

48 ι Cancri; STRUVE 307; IV. 52;

Double, considerably unequal; large fine yellow; small indigo blue; very decided and beautiful; 6th and 8th, or 9th magnitudes.

Feb. 22, 1822.

Five-feet Equatorial.

np

Position. ° ° ′		Distance. Parts.	
90—51.36	H	93. 5	H
52. 0	H	92. 6	H
52.31	H	94. 9	H
52.35	H	94. 8	H
51.35	S	95. 5	S
53.40	S	93. 8	S
52.20	S	94. 1	S
52. 6	S	94. 3	S
Mean — 52.18		Mean = 94.19	
		Z = — 1.14	
		93.05	

Position = 37° 42′ *np*
Distance = 29″.387

March 8, 1823.

Five-feet Equatorial.

6th and 9th magnitudes.

np

Position. ° ° ′	
90—52.25	S
51.50	S
52.30	S
53. 0	S
51.40	S
Mean — 52.17	

Position = 37° 43′ *np*.

Mean result.

Position 37°. 42′ *n p*. Distance 29″.387; 1822.26.

Sir W. HERSCHEL's Obs. in the Catalogue of 1785, are,

Position 39° 54′ *np*; 1783.14. Distance 29″.90; 1782.99.

Mr. STRUVE, (Dorpat Obs. iii. 361.) makes the Position 37°. 6′ *np*; 1821.13.

In a MS. Observation of Feb. 8, 1782, the small star is called *deep garnet*: in another of Dec. 28, 1782, bluish; and in a third, dated March 12, 1785, we have large red; small blue; fine colours. Are the colours of the stars liable to change as well as the intensity of their light? There is no impossibility in this, and the point merits attention. This star therefore should be watched. The position and distance are unchanged.

No. XCVI. R. A. 8h 39m; Decl. 71° 27′ N.

(144 of the 145.)

As nearly equal as possible; each of the 8th or 8½ magnitudes.

April 27, 1823.

Seven-feet Equatorial.

nf or *sp*

Position = 58°.30′ *nf* or *sp*

Distance = 8″.704.

A 3d star at some distance about 20° *sf*. It is very faint, and bears no illumination in the 7 feet.

Position. ° ′	Distance. Parts.
58.10	35. 2
58.40	35. 3
59.14	37. 7
58.34 S	35. 8 S
59.15	38. 2
57.15	38. 7
58.20	38. 5
Mean = 58.30	Mean = — 37.06
	Z = — 0.86
	36.20

May 4, 1823.

Seven-feet equatorial.

equal each 9 magnitude H.

sp or *nf*

Position.		Distance. Parts.	
58°.30′	H	38. 9	H
59. 0	H	38. 5	H
59.45	H	36. 0	H
60.15	H	36. 8	H
59.12	H	36. 2	H
Mean = 59.20		Mean = 37.28	
		Z = − 0.34	
		36.94	

Position = 59°.20′ *nf* or *sp*
Distance = 8″.802

Mean result.

Position 58° 51′ *sp* or *nf*. Distance 8″.745; 1823.33.

No. XCVII. R. A. $8^h\ 41^m$; Decl. 15° 29′ N.

Mean 54 Cancri; STRUVE 311; IV. 111;

Double, unequal; 8th and 9th magnitudes; or 8th and 10th.

Feb. 3, 1822.

Five-feet Equatorial.

sf

Position.		Distance. Parts.	
90°—56°.30′	H	55. 0	H
54.47	H	50. 0	H
56.20	H	54. 0	H
53.40	H	53. 5	S
54. 0	H	54. 8	S
57.40	S	53. 2	S
55.58	S	54. 2	S
55.43	S	52. 5	H
56.32	S	53. 6	H
56. 8	S	54. 2	S
Mean — 55.44		Mean = 53.50	
		Z = − 1.19	
		52.31	

Position = 34°.16′ *sf*
Distance = 16″.521

Position 29° 0′ *sf*; Distance 17″.24; 1783.13. H. Catalogue of 1785.

The position appears to have undergone a slight change.

No. XCVIII. R. A. 8h 43m; Decl. 31° 16′ N.

57 ι² Cancri; Struve 314; I. 30;

Double; nearly equal; their discs in contact with a power of 303.

Feb. 22, 1822.

Five-feet Equatorial.

n p

Position.		Distance. Parts.	
90—19.30	H	0. 9	H
21.30	H	3. 1	H
18.10	H	2. 9	S
16. 0	H	2. 2	S
17.15	S	2. 2	S
21.50	S		
22.11	S		
22.10	S		
Mean = —19.49		Mean = 2.26	
		Z = — 1.14	
		1.12	
		Diameter of 1 wire = 4.88	
		6.00	

Position = 70°.11′ *n p*
Distance = 1″.894.

In the above measures, the exterior edges of the wires were made to bisect the stars; so that the diameter of the wire must be added to the result.

This star remains unchanged, the measures of Sir W. H. being,

Position 68° 12′ *np*; Interval not ½ diameter of S. 1782.29.

No. XCIX. R. A. 8h 47m; Decl. 7° 17′ S.

17 Hydræ; Struve 315; II. 77;

Double; equal; a beautiful object.

Feb. 14, 1822.

Five-feet Equatorial.

n p or *s f*

Position.		Distance. Parts.	
90—2. 0	H	16. 5	H
3.12	H	18. 0	H
3.58	H	16. 5	H
4.22	H	17. 2	H
2.45	H	19. 1	H
5. 0	S	19. 0	H
3.46	S	19. 5	S
4.44	S	19. 2	S
4. 2	S	19. 1	S
4.48	S	20. 0	S
		19. 0	S
Mean = — 3.52		Mean = 18.46	
		Z = — 0.34	
		18.12	

Position = 86°8′ *np* or *sf*
Distance = 5″.723.

The measures difficult from variable refraction.

17 Hydræ continued.

Other measures of this star are,

Position 83° 0′ *n p*; 1782.99; Sir W. HERSCHEL. MS.
90 0 *n*; 1783.03; Ditto, Catalogue of 1785.
86 30 *np*; 1783.01; mean of the two.
89 21 *sf*; 1802.10; Ditto. MS.

1821.92; Position 85° 12′ *np*; Distance 4″.906 from △ decl. 4″.70; STRUVE, Dorpat Obs. iii.

The angle therefore appears liable to no change, any more than the distance, for the interval between the discs, being in 1783 2¼ diameters of the large star, gives about 5 or 6″ for the distance from centre to centre.

No. C. R. A. 8h 49m; Decl. 33° 7′ N.

σ^3 Cancri; STRUVE 317; VI. 41;

Double; 5th or 6th, and 8th or 9th magnitudes.

April 19, 1823.
Five-feet Equatorial.
n p

Position. ° ° ′		Distance. Parts.	
90—65. 4	H	283. 0	H
66. 0	H	288. 0	H
64.48	H	286. 0	H
64.37	H	287. 5	H
64.10	H	283. 2	H
65.30	S	284. 0	S
65.40	S	284. 5	S
65. 0	S	286. 5	S
65.53	S	287. 3	S
65. 5	S	285. 7	S
Mean = — 65.11		Mean = 285.57	
		Z = — 1.45	
		284.12	

Position = 24°.49′ *n p*
Distance = 1′ 29″.731

According to Sir W. HERSCHEL, the measures are,

Position 25° 12′ *n p*; Distance 1′ 25″.75; 1783.13.

M. STRUVE (1821.28) made the Position 23° 18′ *np* by 5 measures. Dorp. Obs. iii. 135.

The distance has sustained an increase of 4″ if both measures be correct.

No. CI. R. A. $8^h\ 51^m$; Decl. 28° 36′ N.

67 ρ Cancri; STRUVE 319; IV. 41;

Double; 6th and 8th magnitudes.

April 19, 1823.

Five-feet Equatorial.

n p

Position.		Distance. Parts.	
90°—36°.30′	H	331. 0	H
37.25	H	329. 8	H
37.15	H	327. 4	H
36.35	H	330. 5	H
38. 0	H	327. 0	H
37.45	S	326. 0	S
36.45	S	328. 7	S
37.51	S	329. 0	S
37.30	S	326. 0	S
37.45	S	325. 0	S
Mean = — 37.20		Mean = 328.04	
		Z = — 1.45	
		326.59	

Position = 52°.40′ *n p*

Distance = 1′.43″.144

According to Sir W. HERSCHEL, this star gave, in 1782, Position 50° 33′ *np*; Distance 1′ 35″.98; 1782.29.

The constancy of the angle, contrasted with the enormous change of 7″.164 in the distance, is very remarkable.

No. CII. R. A. $8^h\ 57^m$; Decl. 23° 42′ N.

194 BODE Cancri; STRUVE 323; III. 92;

Double; rather unequal; 7th and 8th magnitudes.

In a direct line with them is a distant star C of the 9th magnitude.

Feb. 10, 1823.

Five-feet Equatorial.

s p

Position. ° ′		Distance. Parts.	
69. 0	H	23. 9	H
69.15	H	24. 5	H
68.14	H	24. 0	H
68.13	H	25. 0	H
68. 6	H	25. 7	H
71. 0	S	26. 5	S
70. 0	S	26. 3	S
71.30	S	24. 7	S
71. 0	S	26. 8	S
71. 5	S	25 7	S
68.45	H		
71.30	S		
Mean = 69.48		Mean = 25.32	
		Z = — 1.79	
		23.52	

Position = 69°.48′ *s p*

Distance = 7″.428

Distant star C.

When the wire is set to the position of AB, it passes exactly through C, AC *sp*.

Distance of AC 6′. 44″ single measure.

194 BODE Cancri continued.

April 9, 1823.
Five-feet Equatorial.
sp
7 and $7\frac{1}{2}$ magnitudes.

Position.		Distance Parts.	
° ′			
67. 0	H	25. 5	H
67.58	H	24. 0	H
67.52	H	24. 2	H
65.35	H	25. 1	H
66.40	H	26. 0	H
67. 0	S	26. 5	S
67.15	S	26. 2	S
68. 0	S	25. 5	S
67.15	S	26. 0	S
67.30	S	24. 5	S
Mean = 67.12		Mean = 25.35	
		Z = − 0.49	
		24.86	

Position $= 67^\circ.12'$ *sp*
Distance $= 7''.852$

Measures very satisfactory.

Mean result.

Position 68° 37′ *sp*. Distance 7″.640; 1823.19.

Sir W. HERSCHEL'S measures are,

Position 65° 12′ *sp*. Distance 8″.83; 1783.13.

M. STRUVE'S Position (1820.95) is 70° 30′ *sp*, by 2 measures.
Dorpat. Obs. iii. 134.

The angle therefore is not materially altered; but a diminution of 1.19 in so small a distance, is too much to be attributed to error of observation alone.

No. CIII. R. A. $8^h\ 59^m$; Decl. 62° 24′ N.

(H. C. 383 or 53 BODE Ursæ Major;) (79 of the 145;)

Double; rather unequal; 6 and $6\frac{1}{2}$ magnitudes.

Feb. 10, 1823.
Five-feet Equatorial.
nf

Position.		Distance. Parts.	
° ′			
65.12	H	82. 3	H
63.20	H	85. 3	H
63.30	H	81. 3	H
65. 2	H	84. 8	H
63.28	H	83. 5	H
64. 0	S	84. 0	S
64.50	S	81. 0	S
65.10	S	81. 4	S
65.29	S	82. 5	S
64.28	S	84. 5	S
Mean = 64.27		Mean = 83.06	
		Z = − 1.79	
		81.27	

Position $= 64^\circ.27'$ *nf*
Distance $= 25.''667$

(H. C. 383 or 53 Bode Ursæ Majoris) continued.

April 24, 1823.
Five-feet Equatorial.
nf
7 and $7\frac{1}{4}$ magnitudes.

Position.		Distance. Parts.	
° ′			
65.40	S	81. 2	S
65.50	S	80. 5	S
65.10	S	83. 7	S
65.50	S	81. 4	S
64.30	S	80. 8	S
66.25	S	81. 5	S
Mean = 65.34		Mean = 81.52	
		Z = — 2.10	
		79.42	

Position = 65°.34′ *nf*
Distance = 25″.082

May 4, 1823.
Five-feet Equatorial.
nf

Position.		Distance. Parts.	
° ′			
64.50	H	80. 0	H
64.45	H	81. 1	H
64.40	H	77. 5	H
64.38	H	78. 6	H
64.12	H	79. 0	H
64.37		Mean = 79.24	
		Z = — 0.01	
		Mean = 79.23	

Position = 64°.37′ *nf*
Distance = 25″.022

Mean result.

Position 64° 49′ *nf*. Distance 25″.346; 1823.26.

No. CIV. R. A. 9^h 7^m; Decl. 37° 34′ N.

38 Lyncis; Struve 333; I. 9;

Considerably unequal; large white; small bluish;

March. 20, 1821.
Five-feet Equatorial.
sp

Position.	
° ′	
27. 0	H
27.22	H
26.40	H
29.28	S
29.10	S
29.32	S
Mean = 28.12	

Position = 28° 12′ *sp*

38 Lyncis continued

Feb. 22, 1822.

Five-feeet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
31. 0	H	10. 5	H
24.30	H	8. 0	H
25.33	H	9. 2	H
25.16	H	8. 9	H
25.48	H	10. 4	S
26. 0	S	10. 0	S
25.28	S	10. 3	S
24.50	S	11. 5	S
24.12	S	11. 1	S
Mean = 25.51		Mean = 10.00	
		Z = − 1.14	
		8.86	

Position = 25°.51′ *sp*
Distance = 2″.799

March 19, 1823.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
29.30	S	10. 0	S
29.10	S	9. 0	S
28.49	S	11. 0	S
25.40	S		
28.28	S		
27.50	S		
Mean = 28.13		Mean = 10. 0	
		Z = − 1.43	
		8.57	

Position = 28°.13′ *sp*
Distance = 2″.707

April 11, 1823.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
25. 5	H	12. 3	H
32.35	H	11. 0	H
28.15	H	10. 5	H
30.17	H		
25.35	H		
25.41	H		
27.39	H		
Mean = 27.52		Mean = 11.27	
		Z = − 0.73	
		Mean = 10.54	

Position = 27°.52′ *sp*
Distance = 3″.329

Mean result.

Position 27° 20′ *sp*. Distance 2″.887; Epoch 1822.46.

According to Sir W. H. Position 25° 51′ *sp*. Interval 1¼ diameter of L. 1782.41.

According to STRUVE. Position 29° 42′ *sp*, by 13 measures, Dorpat Obs. iii. 1820.80

There seems to have arisen some doubt whether the star I. 9, is the same with 38 or 39 of Flamsteed; but the agreement of the measures here given with those of the Cata-

logue of 1782, proves that the star I. 9, and that here measured, are identical. The proper motion suspected in one of the stars is not verified.

No. CV. R. A. $9^h\ 12^m$; Decl. $8^\circ\ 48'$ S.

27 Hydræ; VI. 85.

Double, pretty unequal; 7th and 8th magnitudes.

Feb. 19, 1823.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
59.25	S	718. 0	S
59.28	S	716. 5	S
59.10	S	716. 2	S
Mean = 59.21		Mean = 716.90	
		Z = − 2.29	
		714.61	

Position = $59^\circ.21'$ *sp*
Distance = $3'.45''.689$

Position about 60° *sp*; VIth Class, far; Catalogue of 1785.

No. CVI. R. A. $9^h\ 20^m$; Decl. $2^\circ\ 0'$ S.

τ Hydræ; STRUVE 344; VI. 71;

Considerably unequal; large reddish white; small bluish.

March 25, 1821.

Five-feet Equatorial.

nf

Position.		Distance. Parts.	
° ′			
86. 2	H	210. 8	H
87,20	H	209. 4	H
87.43	H	209. 1	H
87.15	S	211. 3	H
86.35	S	211. 2	S
86. 2	S	211. 0	S
Mean = 86.49		213. 5	S
		210. 2	S
		211. 5	S
		213. 2	S
		212. 2	S
		Mean = 211.22	
		Z = − 0.08	
		211.14	

Position = $86^\circ.49$ *nf*
Distance = $1'.6''.683$

By Sir W. HERSCHEL's measures we have for this star,

Position 88° 36′ *np*. Distance $1'.1''.667$; 1783.34.

Considering the distance of these stars, it can hardly be doubted therefore that they have sustained a very sensible change of position, and a great increase of distance.

No. CVII. R. A. $9^h\ 22^m$; Decl. $10°\ 30'$ N.

6 Leonis; STRUVE 346; V. 26;

Double; extremely or excessively unequal; large reddish; small dusky.

Feb. 27, 1822.
Five-feet Equatorial.
nf

Position. ° ′	
16.48	H
15.44	H
14.59	H
14.45	H
17.32	H
14. 0	S
14.10	S
15.50	S
14.42	S
15.58	S
Mean = 15.27	

Distance. Parts.	
122. 0	H
121. 5	H
119. 0	H
119. 8	H
121. 0	S
121. 7	S
121. 9	S
122. 7	S
Mean = 121.20	
Z = − 0.47	
120.73	

Position = 15°.27′ *nf*
Distance = 38″.128

Other measures of this star are,

Position 12° 55′ *nf*. Distance 36″.15; 1782.30; H. Cat. of 1782 and MSS.

17 43 *nf*; by 5 measures 1821.28; STRUVE, Dorp. Obs. iii.

No. CVIII. R. A. $9^h\ 26^m$; Decl. $15°\ 10'$ N.

7 Leonis; STRUVE 350; V 58;

Extremely unequal; the small star is exceedingly faint, but the evening is very beautiful.

March 25, 1821.
Five-feet Equatorial.
nf

Position. ° ′	
9.36	H
9.45	H
9.50	S
11. 0	S
9.45	S
7.38	H
7.32	H
9. 5	H
10.36	H
Mean =— 9.25	

Distance. Parts.	
142. 2	H
141. 1	S
140. 0	S
138. 7	S
137. 5	H
142. 0	H
138. 7	H
Mean = 140.03	
Z = − 0.08	
139.95	

Position = 9°.25′ *nf*
Distance = 44″.199

1783.09; Position 8° 36′ *nf*. Distance 42″.41; H. Cat. of 1785

1821.28; 10 9 *nf*; by 5 measures, STRUVE, Dorp. Obs. iii.

No. CIX. R. A. $9^h\ 32^m$; Decl. 10° 43′ N.
14 Leonis; STRUVE 351; VI. 76;
Double; 4th and 15th magnitudes.

Position.	April 11, 1823.	Distance. Parts.
° ′	Five-feet Equatorial.	
56.35 } H	*nf*	220 H
52. 5 } H		230 } S
52.35 } H		225 } S
57. 5 } H		
51.37 } S		Mean = 225. 0
52.57 } S	Position = 53°.38′ *nf*	Z = − 0.73
52.35 } S	Distance = 1′ 10″.829	224.27
Mean = 53.38		

Measures, particularly of distance, excessively difficult.

1783.06; Position 49° 36′ *nf*; Distance 1′ 3″.48; H. Catalogue of 1785.

An increase of distance to the extent of 7″.349 has taken place, if all the measures are to be depended on.

No. CX. R. A. $9^h\ 56^m$; Decl. 17° 12′ S.
(25 of the 145); BODE 40 Felis;
April 24, 1823.
Double; 8th and 9th magnitudes; but the evening very hazy, and stars but of low altitude.

Position.	Five-feet Equatorial.	Distance. Parts.
° ′	*np*	
−0.50 } S		70. 5 } S
1.43 } S		72. 4 } S
0.18 } S		74. 0 } S
0. 7 } S	Position = 0° 34′ *np*	74. 5 } S
0. 6 } S		72. 0 } S
Mean = 0.34	Distance = 22″.291	Mean = 72.68
		Z = − 2 10
		70.58

These measures are not so good as might be wished.

40 Felis continued.

May 4, 1823.
Five-feet Equatorial.
7 and 7 $\frac{1}{2}$ magnitudes.
n p

Position.		Distance. Parts.	
° ° ′			
90—87.12	H	67. 8	H
86. 6	H	68. 0	H
87.26	H	66. 7	H
87. 4	H	66. 6	H
87.25	H	66. 0	H
88.10	S	68. 0	S
87.30	S	69. 2	S
87. 0	S	69. 7	S
87.40	S	69. 0	S
87. 0	S	69. 8	S
Mean = — 87.15		Mean = 68.08	
		Z = — 0.01	
		68.07	

Position = 2°.45′ *n p*
Distance = 21″.498

The observations of April 24 must be rejected, and those of May 4 received as a final result; the former having been made under unfavourable circumstances, and differing too much from the latter, against which there is nothing to raise an objection, the night having been very fine.

No. CXI. R. A. $9^h\ 59^m$; Decl. 12° 51′ N.

Regulus; STRUVE 357; VI. 11;

Extremely unequal; large white; small bluish.

March 15, 1821.
n p

Position.	
° ° ′	
90 - 52.28	H
52.37	H
Mean = - 52 32	

Position = 37°.28′ *np*

Regulus continued

Position.		March 20, 1821. *np*	Distance. Parts.	
90°—53°.41′	H		556.0	S
52.42	H		557.2	S
52.38	H		555.0	S
52.39	S		559.0	H
52.35	S	Position = 37° 13′ *np*	558.1	H
53.30	S	Distance = 2′54″.906	556.5	H
52.13	H			
Mean = —52.47			Mean = 556.97	
			Z = — 3.16	
			553.81	

Mean result.

Position 37° 16′ *np* ; *Distance* 2′ 54″.906 ; *Epoch* 1821.21
1781.84 Pos. 35 5 *np* ; Distance 2 48 .33 ; H. Cat. of 1782.

The distance appears to have increased no less than 6″.576 ; and in so distant a star an error of 2° could scarcely have been commited in the angles, so that the position must have sustained a slight alteration.

M. Struve, Dorpat Obs. iii. makes the difference of declinations of the two stars 1′ 44″.26 (1821.90). Our measures computed give 1′ 45″.791 for the same difference, which agrees precisely with one of his single measures.

No. CXII. R. A. $10^h\ 3^m$; Decl. 71° 55′ N.
(145 of the 145) ;
Double ; 7th and 8th magnitudes.

Position.		April 27, 1823. Five-feet Equatorial. *sf*	Distance. Parts.	
90°—14°.30′	S		54.3	S
14.56	S		53.3	S
16.0	S		53.4	S
15.34	S	Position = 74° 30′ *sf*	55.0	S
15.38	S	Distance = 16″.988	53.4	S
			52.5	S
Mean = —15.30			Mean = 53.65	
			Z = + 0.14	
			53.79	

145 of the 145 continued.

Position.		Distance. Parts.
° ° ′	May 4, 1823.	
90—13.45 H	Five-feet Equatorial.	53. 8 H
13.50 H	7th and 8th mag. H.	52. 3 H
14.50 H	*sf*	52. 0 H
14.25 H		53. 5 H
13.50 H		52. 7 H
13.15 H	Position = 76° 1′ *sf*	53. 0 H
Mean = — 13.59	Distance = 16″.698	Mean = 52.88
		Z = — 0.01
		52.87

Mean result.

Position 75° 20′ *sf*; Distance 16″.843; 1823.33.

This star was found in looking for the 145th of Sir W. HERSCHEL'S Catalogue of 145 new double stars, with which however the distance agrees but ill, as it is there called "about ¾ of a minute *sf*;" but a random guess in the course of a sweep is entitled to no great reliance.

No. CXIII. R. A. $10^h\ 10^m$; Decl. 20° 45′ N.

γ Leonis; STRUVE 360; I. 28;

Unequal; both reddish.

Position.		Distance. Parts.
° ° ′		
90—85.25 H	March 27, 1821.	9. 0 H
87. 5 S	Five-feet Equatorial.	12. 0 S
86.35 S	*sf*	Mean = 10. 5
83.15 H		Z = — 0.08
83.54 H		10.47
86. 0 H		
83. 7 H		
80. 8 H		
81.35 H	Position = 6° 25′ *sf*	
81.56 H		
80.28 S	Distance 3″.306	
Mean = — 83.35		

γ Leonis continued.

April 27, 1821.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
° ° ′			
90—82.14	H	10. 5	S
81.10	H	11. 0	S
82.45	H	10. 0	S
81. 2	H	10. 0	S
80.18	H	11. 0	S
80.39	S	9. 1	H
81.10	S	10. 0	H
80.55	S	9. 2	H
80.40	S	10. 3	H
80.33	S	10. 7	H
80.15	S	Mean = 10.18	
80.32	S	Z = — 0.11	
Mean = — 81. 1		10.07	

Position = 8°.59′ *sf*
Distance = 3″.180

NB. The stars perfectly round and cleanly divided. The rings about them exactly formed, and at perfect rest.

Feb. 19, 1823.

Quadruple; AB pretty unequal; very close. AC extremely unequal; AD excessively unequal; both north preceding; very faint and distant.

Five-feet Equatorial.

Position of AC = 27° 30′ ± *np*

Position of AB = 11° 13′ *sf*
(night unfavourable.)

Of AB	
° ° ′	
90—80.35	S
77.30	S
78.20	S
78.35	S
79. 3	S
79.27	S
78. 0	S
Mean = — 78.47	

April 19, 1823.
Five-feet Equatorial.
sf

Position.	
° ° ′	
90—82.45	H
80.40	H
82. 0	H
81.30	H
83.20	H
83. 0	H
82. 5	S
81.50	S
81.41	S
82. 5	S
81.12	S
Mean = — 82. 1	

Position = 7° 59′ *sf*

NB. Very good measures, and no doubt accurate.

γ Leonis continued.

Mean result.

Position 8° 24′ *sf*; Distance 3″.243; 1822.24.

The difference of size and closeness of these stars renders the measure of their position uncommonly difficult: but as the angle here set down is a mean of 41 single measures, we cannot suppose it materially in error, especially as it is very nearly a mean between the results of the two best sets of observations—those of April, 1821, and April, 1823, which, taken alone, would give 8° 29′ *sf*.

Other measures of this remarkable star are,

1782.71:	Position 6° 30′ *nf*;	H. mean of 2 meas. in 1782 and 1783, "Account of changes, &c."
1801.72;	4 42 *sf*;	H. mean of 7 measures from 1800 to 1803.
1820.28;	10 32 *sf*;	Distance 3″.74; STRUVE, Additamenta, &c. 176.
1820.91:	9 18 *sf*;	STRUVE, Dorpat Obs. iii. by 19 measures in 1820 and 1821.

The 1st position assigned by Mr. STRUVE is a mean of three measures, one of which, 13° 39′ *sf*, is undoubtedly erroneous, being larger than any single measure of ours, among so many. If we reject this, the mean of the other two comes out 8° 59′, which agrees exactly with the result of our best set of observations.

Position of the star C, 31° 0′ *np*; H. MS. 20-feet reflector, 1783.30.

27 30 *np* ±; H. and S. as above.

γ Leonis continued.

There can be no doubt of the motion of γ Leonis, though it is probably less rapid than supposed by Sir W. H. That no mistake in the quadrant (*nf* for *sf*) was made in the observations made in the years 1782-3, is proved by the diagrams made at the time, in which the small star is placed on the same side of the parallel (i. e. *north*) with the distant stars C and D. The mean annual motion from the most distant observations comes out $+ 0^\circ.30$, direct, or in the direction *nf sp*.

No. CXIV. R. A. $10^h\ 11^m$; Decl. $7^\circ\ 22'$ N.

145 Bode Leonis; Struve 361; II. 43;

Double; extremely unequal; 9th or 12th or 15th magnitudes. A most difficult star to measure.

Feb. 21, 1823.
Five-feet Equatorial.
nf

Position. ° ′		Distance. Parts.	
81.30	H	22. 0	H
79. 0	H	21. 0	H
82. 5	H	20. 0	H
80. 2	S	23. 0	H
79.35	S	23. 3	S
79.13	S	21. 8	S
80.20	S	21. 4	S
		22. 6	S
Mean = 80.15		Mean = 21.89	
		Z = − 0.60	
		21.29	

Position $= 80^\circ\ 15'$ *nf*
Distance $= 6''.723$.

1782.13; The Position was $85^\circ\ 2'$ *nf*; Interval 2 or $2\frac{1}{4}$ D; H. Catal. of 1785.

1821.11; Position $80^\circ\ 51'$ *nf*; Distance $7''.081$ from $\triangle$ Decl. $6''.99$; Struve, Dorp. Obs. iii.

The position may have undergone a slight change, but the distance remains nearly as it was.

No. CXV. R. A. $10^h\ 14^m$; Decl. $6^\circ\ 38'$ N.

155 BODE Leonis; STRUVE 362; V. 64;

Double; excessively unequal; 7th and 12th magnitudes; excessively difficult to measure.

Feb. 12, 1823.

n p

Five-feet Equatorial.

Position.		Distance. Parts.	
90°—28° 56′	H	206. 0	H
28. 50	H	210. 0	S
32. 5	H	Mean = 208. 0	
33. 30	H	Z = − 1.33	
31. 50	S	206.67	
32. 30	S		
33. 10	S		
Mean = — 31.33			

Position = 58° 27′ *n p*

Distance = 1′ 5″.269

Feb. 21, 1823.

Seven-feet Equatorial.

n p

Position.		Distance. Parts.	
90°—28° 36′	H	243. 0	H
26. 5	H	248. 0	H
27. 8	H	238. 0	H
28. 11	H	243. 0	H
28. 0	H	246. 0	H
Mean = — 27.36		Mean = 243.60	
		Z = − 0.52	
		243.08	

Position = 62° 24′ *np*

Distance = 58″.447

Measures of distance attended with considerable difficulty. H.

March 11, 1823.

Seven-feet Equatorial.

n p

7th and 15th magnitudes.

Position.		Distance. Parts,	
90°—29° 30′	S	252. 0	S
28.52	S	246. 0	S
29.45	S	250. 0	S
28.16	S	251. 0	S
28.22	S	250. 0	S
Mean — 28.57		Mean = 249.80	
		Z = + 1.29	
		251.09	

Position = 61°.3′ *n p*

Distance = 1′.0″.374

Excessively difficult; small star bears scarcely any illumination. (S.)

Mean result.

Position 60° 23′ *np*. Distance 1′.0″.387; 1823.14.

The distance has undergone no appreciable change. In 1783 it was 59″.67 by a single measure. (H. Catalogue of 1785.) No position is given.

No. CXVI. R. A. 10^h 34^m; Decl. 5° 42′ N.
(36 of the 145 and 35* Sextantis);
A beautiful double star; 7th and $7\frac{1}{2}$ magnitudes.

April 24, 1823.
Five-feet Equatorial.
s p

Position. ° ′		Distance. Parts.	
32.10	S	26. 0	S
34.30		26. 5	
34.15		27. 0	
30.43		26. 5	
33.43		27. 7	
32.30		25. 5	
Mean = 32.56		Mean = 26.53	
		Z = — 2.10	
		24.43	

Position = 32°.56′ *s p*
Distance = 7″.715

May 3, 1823
Five-feet Equatorial.
7th and 8th magnitudes
s p

Distance. Parts.	
26. 3	H
25. 0	
24. 9	
26. 1	
26. 4	
Mean = 25.74	
Z = — 0.24	
25.50	

Distant star.

Angle of Position 60° 30′ *sp*. Distance = 5′.33″.5 single measure.

May 6, 1823.
Five-feet Equatorial.
s p

Position. ° ′	
31.10	Mr. Richardson.
30. 5	
29.50	
31.41	
32. 6	
33. 6	
33. 6	
33. 0	
32.38	
33.30	
33. 6	
32.48	
32.40	
32.28	
Mean = 32.13	

Mean result.

Position 32° 26 *sp*. Distance 7″.869; Epoch 1822.33; 1821.31; Position 31° 44′ *s p*. Struve, Dorp. Obs. iii. 9 meas.

* Observed also double by Piazzi.

No. CXVII. R. A. $10^h\ 46^m$; Decl. $25°\ 43'$ N.

54 Leonis; STRUVE 371; III. 30;

A beautiful double star, and admirably defined; the large star may perhaps be called yellowish, but the small one is decidedly of a greenish hue; considerably unequal.

March 22, 1821.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
11°. 0′	S	23. 4	H
10.50	S	27. 0	H
10.50	S	25. 0	H
10.55	S	23. 8	H
6.46	H	20. 0	S
8.43	H	21. 0	S
9.50	H	21. 7	S
8.40	H		
Mean = 9.42 *		Mean = 23.13	
		Z = − 0.08	
		23.05	

Position = 9°.42′ *sf*
Distance = 7″.280

Feb. 27, 1822.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
90°−83°. 7′	H	22. 3	H
82.52	H	22. 1	H
84.38	H	22. 6	H
82.41	H	20. 0	H
84. 0	H	22. 0	S
81. 5	S	21. 5	S
82.15	S	22. 7	S
82.45	S	22. 0	S
82.15	S		
82.17	S		
Mean − 82.47		Mean = 21.90	
		Z = − 0.47	
		21.43	

Position = 7°.13′ *sf*
Distance = 6″.767.

Mean result.

Position 8° 19′ *sf.* Distance 7″.023; Epoch 1821.68.

1782.12.	Position 9° 14′ *sf.*	Distance 7″.10;	H. Cat. 1782
1802.10.	10 39 *sf.*		H. MS.
1820.86.	12 34 *sf.*		STRUVE Dorp. Obs. iii.

No. CXVIII. R. A. $10^h\ 49^m$; Decl. $59^\circ\ 50'$ N.

(97 of the 145); STRUVE 373; V. 111;

Double; 7th and 9th magnitudes; large white; small blue.

April 24, 1823.

Five-feet Equatorial.

nf

Position $= 51^\circ.33'$ *nf*

Distance $= 34''.588$

Position. ° ′		Distance. Parts.	
51.37	S	109. 2	S
51.15		114. 0	
52. 5		112. 5	
50.58		112. 0	
51.51		110. 5	
		111. 5	
Mean = 51.33		Mean = 111.62	
		Z = − 2.10	
		109.52	

Five-feet Equatorial.

7th and $8\frac{1}{2}$ magnitudes.

nf

Position $= 52^\circ\ 3'$ *nf*

Distance $= 34''.866$.

Position. ° ′		Distance. Parts.	
52. 0	S	109. 8	S
51.30		113. 7	
51.45		113. 5	
52. 7		110. 2	
51.54		115. 0	
53. 0		112. 8	
Mean = 52. 3		Mean = 112.50	
		Z = − 2.10	
		110.40	

These measures were taken unintentionally, being unaware at the time that it was the same star which had been measured in the earlier part of the evening. (S).

May 4, 1823.

Five-feet Equatorial.

7th and 9th mag. H.

nf

Position $= 51^\circ.43'$ *nf*

Distance $= 35''.577$

Position. ° ′		Distance. Parts.	
50.45	H	112. 8	H
51.55		112. 4	
51.44		113. 2	
52.55		113. 5	
51.12		111. 4	
51.45			
Mean = 51.43		Mean = 112.66	
		Z = − 0.01	
		112 65	

The measures very difficult.

Mean result.

Position $51^\circ\ 46'$ *nf*. Distance $35''.010$; Epoch 1823.34.

This star is doubtless identical with V. 111, whose measures are stated by Sir W. HERSCHEL as follows:

Position $51^\circ\ 27'$ *nf*. Distance $30''.667$; 1783.66.

(97 of the 145) continued.

The place of V. 111, as given in STRUVE'S Catalogue, (No. 373), is R. A. $10^h\ 47^m\ 7^s$; Decl. 59° 41′ N, which is very erroneous. This is settled by two 20-feet sweeps, April 8th and 9th, 1793, at which epoch it was R. A. $10^h\ 47^m\ 7^s$; P. D. 30° 1′; which reduced to 1823, gives R. A. $10^h\ 48^m\ 11^s$; P. D. 30° 7′ 18″. It must therefore have been in the field of the equatorial when set as above.

No. CXIX. R. A. $11^h\ 6^m$; Decl. 53° 44′ N.

(68 of the 145);

Double; 7th and 8½ magnitudes.

April 24, 1823.

Five-feet Equatorial.

np

Position = 75°.57′ *n p*
Distance = 13″.084

Position. ° ° ′		Distance. Parts.	
90—14.15	S	43. 5	S
15.27		43. 9	
13.20		43. 2	
13.15		42. 3	
13.10		44. 1	
14.50		44. 2	
Mean = 14. 3		Mean = 43.53	
		Z = — 2.10	
		41.43	

May 3, 1823.

Five-feet Equatorial.

np

Position = 74°.55′ *n p*
Distance = 13″.215

Position. ° ° ′		Distance. Parts.	
90—15.28	H	43. 0	H
15.44		40. 0	
15. 0		44. 4	
14. 1		39. 9	
15.12		43. 1	
Mean = 15. 5		Mean = 42.08	
		Z = — 0.24	
		41.84	

Mean result.

Position 75°. 29′ np. Distance 13″.144.

No. CXX. R. A. $11^h\ 8^m$; Decl. 6° 8′ S.

(26 of the 145.)

Double; 7th and 9th magnitudes; large white; small blue.

April 24, 1823.

Five-feet Equatorial.

sf

Position.		Distance. Parts.	
90°—83°.10′	S	213. 0	S
82.15		215. 3	
81.45		213. 9	
82. 5		215. 9	
82.40		214. 1	
Mean = — 82.23		Mean = 214.44	
		Z = — 2.10	
		212.34	

Position = 7°.37′ *sf*
Distance = 1′.7″.062

No. CXXI. R. A. $11^h\ 8^m$; Decl. 2° 40′ S.

φ Leonis; Struve 380; VI. 79;

Very unequal; two other stars in the field at considerable distances.

March 27, 1821.

Five-feet Equatorial.

np

Position.		Distance. Parts.	
90°—72°.50′	H	336. 8	H
73.11		340. 0	
73.32		336. 3	
73.20	S	336. 0	S
72.30		335. 0	
73. 0		335. 0	
Mean = — 73. 4		Mean = 336.52	
		Z = — 0.08	
		336.44	

Position = 16° 56′ *np*
Distance = 1′.46″.256.

H. Catalogue of 1785. Position 10° or 12° *np*. Distance 1′.38″.58; 1783.07.

An increase of distance amounting to 7″.676.

No. CXXII. R. A. $11^h\ 9^m$; Decl. $32^\circ\ 33'$ N.

ξ Ursæ Majoris; STRUVE 381; I. 2;

Double; very nearly equal; 6th and $6\frac{1}{4}$ magnitudes: positively South preceding, S. and H.

Feb. 12, 1823.

Five-feet Equatorial.

s p

Position. ° ′		
9. 0	H	Power 133.
11.24	H	
10.10	H	
9. 0	H	
9.45	H	
11.30	S	Power 133.
11.51	S	
11.10	S	
11.36	S	
10. 0	H	Power 303.
10.11	H	
9.20	H	
10. 2	H	
10.15	H	
9.30	S	Power 303.
10. 0	S	
10.50	S	
10.37	S	
10.50	S	
11.10	S	
11.30	S	
12.15	S	Power 133,
12. 5	S	
Mean = 10.37		

Distance. Parts.	
10. 0	H
10. 1	H
10. 5	H
9. 5	H
9. 3	H
10. 0	S
9. 5	S
11. 0	S
9. 8	S
10. 7	S
Mean = 10.04	
Z = − 1.33	
8.61	

Position = 10°.37 *s p*

Distance = 2″.719

April 10, 1823.

6 and $6\frac{1}{4}$ magnitudes.

Five-feet Equatorial.

decidedly *s p*

Position. ° ′	
11. 4	H
10.42	H
10.54	H
11.30	H
11.20	H
12. 0	H
11.50	S
11.35	S
12.10	S
11.36	S
12. 5	S
10.50	S
22. 0	S
Mean = 11.30	

Distance. Parts.	
9. 9	H
10. 2	H
8. 9	H
9. 0	H
9. 5	H
10. 0	S
9. 3	S
10. 3	S
10. 8	S
11. 2	S
Mean = 9.91	
Z = − 0.73	
9.18	

Position = 11°.30′ *s p*

Distance = 2″.899

ξ Ursæ Majoris continued.

June 5, 1823.

Five-feet Equatorial.

Position.	
° '	
9. 0	H
13. 0	H
10.54	H
11.45	H
12.34	H
10.30	H
15. 0	S
15. 0	S
12.20	S
13.14	S
13.10	S
12.15	S
Mean = 12.23	

Position = 12° 23′ *sp*

July 9, 1823.

Five-feet Equatorial.

Position.	
° '	
13.21	S
11.55	S
13.35	S
12.20	S
13.44	S
14. 0	S
11.25	S
11.32	S
10.35	S
13.50	S
Mean = 12.38	

Position = 12°.38′

Measures taken by daylight and strong twilight; stars tolerably steady, but 4^h 20^m past meridian. (S.)

Mean result.

Position 11° 33′ *sp*; 1823.29. *Distance* 2″.809, 1823.19;

The position and dates here given, as well as the distance, are all derived on the supposition of each measure being independent of all the rest, and all equally good. The angle thus obtained from no less than 58 measures, with its corresponding *mean* date, will serve for an epoch in which the computer,

ξ Ursæ Majoris continued.

at some future period, may rely with confidence in any investigation relative to the orbit of this star.

A double star in which the two stars are nearly equal, connected undoubtedly in a binary system by their mutual gravitation, and revolving round their common center of gravity with a motion so rapid as to admit of being traced, and measured *from month to month*, must be allowed to be a phænomenon of no common interest, and deserving every attention, both from the practical and theoretical astronomer. The rapid alteration of position in ξ Ursæ Majoris, was first pointed out and established by unequivocal observations by Sir W. HERSCHEL, in his second " Account of the changes that have happened in the relative situations of double stars," Phil. Trans. 1804, already so often referred to. The observations of M. STRUVE (who has called the attention of astronomers to it in a pointed manner) and our own, fully confirm it; at the same time that they indicate a remarkable alteration in its velocity, which can only be accounted for by supposing the relative orbit to be one of great ellipticity. The whole series of observations from the first notice of it as a double star, to the present time, will stand as follows:

Position.

1781.97	(Dec. 19)	53° 47′ *sf*;	H. Catal. of 1782.
1782.89	(Nov. 20)		nearly equal; but the *preceding* is rather the *largest*. H. Catal. of 1782. MS.
1802.09	(Feb. 4)	7 31 *sf*;	("Account of the changes, &c.")
1804.08	(Jan. 29)	2 38 *sf*;	Ditto. Ditto.

ξ Ursæ Majoris continued.

1819.10	14 33 *np*;	STRUVE, Additamenta, &c. p. 177; by 2 measures.
1820.13	6 21 *np*;	STRUVE, Addit. by 15 meas.
1821.31	1 12 *sp*;	Ditto. Dorpat Obs. iii. p. 361. Obs. 57; by 3 measures.
1822.08	7 21 *sp*;	STRUVE, mean of 4 measures, Dec. 12, 1821, and Jan. 29, 1822; vide Zach. viii. p. 517, and Dorpat Obs. iii. p. 144.
1823.11 (Feb. 12)	10 37 *sp*;	HERSCHEL and SOUTH ut supra.
1823.28 (April 10)	11 30 *sp*;	Ditto.
1823.43 (June 3)	12 23 *sp*;	Ditto.
1823.52 (July 9)	12 38 *sp*;	Ditto.

Distance.

1780; $\frac{2}{3}$ diameter with 222, $1\frac{1}{4}$ with 278 = interval of discs, which would give about 4″ for the distance of the centers.

1819; 2″.565; STRUVE, mean of 2″.73 and 2″.4.

1823; 2″.809; H. and S. ut supra.

The remarkable variation in the angular velocity will best appear by taking the *mean* positions and times as calculated from the observations at or near marked epochs by the different observers, thus

Sir W. HERSCHEL's first determination;	53°.47′ = 53°.79 *sf*;	1781.97.
second ditto.; - -	5 .07 *sf*;	1803.08.
Mean of M. STRUVE's 17 Observations, 1819 and 1820;	7 .32 *np*;	1820.01.
Mean of M. STRUVE's 7 Observations, 1821 and 1822;	4 .71 *sp*;	1821.75.
Mean of the Obs. of H. and S.; - -	11 .55 *sp*;	1823.29.

In the first interval, of 21.11 years, 48°.72 were described, giving an annual motion of 2°.309. In the next interval of

16.93 years, 177°.75 were described, being at the mean rate of 10°.499 per annum. In the next period, of 1.74 years, the angle described was 12°.03, or 6°.914 per annum; while in the succeeding short period of 1.54 years, the motion amounted only to 6°.84 or 4°.442 per annum. It is therefore at present rapidly decreasing, and the maximum annual motion must, at some period between 1803 and 1820, have greatly exceeded 10°.499, and perhaps may have amounted to 20 or 30°. This consideration would lead us to place the perihelion of the orbit in the north-preceding quadrant, between the 30th and 60th degree from the parallel, and to suppose its plane greatly inclined to the visual line, in a plane not far from that passing through the eye and the major axis of the orbit; and this agrees well with the change of distance, which is certainly less at present than in 1782, though the estimation by diameters is necessarily very uncertain.

In the present imperfect state of the data, it would be useless to enter into any minute investigations respecting the elements of the orbit; but when twenty or thirty years observations shall have enabled us to trace precisely the variation of the angular motion up to the aphelion, and to ascertain, by direct observation, the periodic time and mean motion, the principles of physical astronomy may be applied, and the case is one particularly favourable to their application, so that we may hope one day to obtain a precise knowledge of all the most important points respecting this interesting system.

It is to be regretted that owing to an error in the place of this star in BODE's Catalogue, it was not observed by us at an earlier date; the comparison of our observations with those of M. STRUVE being very desirable.

No. CXXIII. R. A. $11^h\ 17'$; Decl. $82°\ 2'$ N.

(201 Bode Camelopardali); Struve 386;

Double; 8th and 10th magnitudes.

Position.	April 11, 1823. Five-feet Equatorial.	Distance. Parts.
° ° ′	*np*	
90—47.15 H		75. 0 H
46.15 H		65. 0 H
46.50 H	Position = 43° 13′ *np*	Mean = 70. 0
Mean = — 46.47	Distance = 21″.876.	Z = 0.73
		69.27

According to M. Struve, who has determined the place of this star in 1814 in his second Catalogue, the difference of declination between the two stars is equal to that of their right ascensions; the magnitudes agree with ours (8 and 10), and the small star precedes. He makes the difference of R. A. by a mean of two observrtions on the wires of a transit, $6^s.6$ of time, whence he concludes the difference of declination 13″.7, and the distance 19″.4. Thus we have, according to these data,

Position 45° *np* or *sp*, " utra polo vicinior non notatum."
Distance 19″.4 vide Dorpat Obs. Catalogus I. No. 92.

No. CXXIV. R. A. $11^h\ 18^m$; Decl. $4°\ 0'$ N.

83 Leonis; Struve 387; IV. 13;

Position.	March 14, 1821.	Distance Parts.
° ′	*sf*	
61.48 H		95. 8 H
61.21 H		96. 5 H
61.11 H		99. 3 H
60.35 S		96. 1 S
60. 0 S	Position = 61° 7′ *sf*	96. 0 S
61.50 S		96. 5 S
Mean = 61. 7	Distance = 29″.542.	Mean = 96.70
		Z = — 3.16
		93.54

83 Leonis continued.

Other measures of this star are,

1782.08 ; Position 54° 56′ *sf*; Distance 29″.08 ; H. Catal. of 1782.

1820.29 ; 62 3 *sf*; STRUVE, Additamenta, &c. 177.

M. STRUVE appears inclined to attribute a slight angular motion to these stars, with which we agree.

No. CXXV. R. A. 11ʰ 19ᵐ; Decl. 3° 50′ N.

84 τ Leonis ; VI. 12 (not in STRUVE'S Catalogue);

Large white ; small bluish.

Position. ° ′		March 14, 1821. *sf*	Distance. Parts.	
78. 4	S		302. 8	S
79.21	S		303. 5	S
78.50	S		302. 5	S
79.21	H		308. 9	H
79.23	H	Position = 79° 8′ *sf*	301. 0	H
79.30	H	Distance = 1′ 35″.217	307. 0	H
79.28	H		307. 0	H
Mean = 79. 8			Mean = 304.65	
			Z = − 3.16	
			301.49	

1782.29 ; Position 75° 21′ *sf*; Distance 1′ 22″.70 ; H. Catal. of 1782, corrected by reference to the original MS. and a marginal MS. note.

An increase of distance to the amount of 13″.147, with very little change of angle, if both measures can be trusted.

No. CXXVI. R. A. $11^h\ 21^m$; Decl. 42° 21′ N.
(70 of the 145);
Double; 7th and 8th magnitudes.

April 22, 1823.
Seven-feet Equatorial.
sf

Position.		Distance. Parts.	
° ′			
—0.15 *sf*	H	55. 8	H
+1. 5 *nf*		51. 3	
—0.50 *sf*		57. 1	
—0.45 *sf*		54. 2	
—0.40 *sf*		56. 8	
		53. 0	
Mean = —0.17		Mean = 54.70	
		Z = — 0.97	
		53.73	

Posiiton = 0° 17′ *sf*
Distance = 12″.918.

Five-feet Equatorial.

Position.		Distance. Parts.	
° ′			
—0.48 *sf*	S	43. 2	S
—0.15 *sf*		42. 8	
—2.20 *sf*		44. 5	
+0.30 *nf*		44. 5	
+0. 0 *nf*		42. 8	
Mean = — 0.35 *sf*		Mean = 43.56	
		Z = — 1.81	
		41.75	

Position = 0′.35″ *sf*
Distance = 13″.186

Mean result.
Position 0° 21′ *sf; Distance* 13″.040; 1823.31.

No. CXXVII. R. A. $11^h\ 23^m$; Decl. 15° 22′ N.
88 Leonis; Struve 390; III. 51;
Extremely unequal; 6th and 10th magnitudes; the small star bears a considerable illumination.

April 9, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
° ° ′			
90—40. 0	H	44. 2	H
40.14		48. 4	
39.45		51. 0	
38. 8		47. 2	
39. 0		45. 1	
39.42	S	44. 5	S
39. 0		46. 5	
40.13		47. 0	
40.51		48. 5	
40.45		47. 0	
Mean = — 39.46		Mean = 46 94	
		Z = — 0.49	
		46.45	

Position = 50° 14′ *np*
Distance = 14″.670.

88 Leonis continued.

The measures are attended with considerable difficulty, but are satisfactory; the night is fine.

1782.30; Position 47° 33′ *np*; Distance 14″.63. H. Catal. of 1785.

1820.80; 53 6 *np*; STRUVE, Dorp. Obs. iii.; 5 measures.

No. CXXVIII. R. A. $11^h 25^m$; Decl. 17° 48′ N.

90 Leonis; STRUVE 391; I. 27;

Triple; AB nearly equal; AC extremely unequal.

March 22, 1821.
Measures of AB
Five-feet Equatorial.

Position.		Distance. Parts.	
° ′ 62.26	H	14. 0	H
60. 2	H	16. 0	H
60.12	H	15. 5	S
61.29	S	13. 0	S
62.43	S	15. 9	S
62.15	S		
Mean = 61.31		Mean = 14.88	
		Z = − 0. 08	
		14.80	

sp
Position = 61° 31′ *sp*
Distance = 4″.675.

March 22, 1821.
Measures of AC
Five-feet Equatorial.

Position.		Distance. Parts.	
° ′ 34.12	H	185. 8	H
37. 0	S	193. 0	S
Mean = 35.36		Mean = 189. 4	
		Z = − 0.08	
		189.32	

sp
Position = 35° 36′ *sp*
Distance = 59″.791.

April 11, 1823.
Five-feet Equatorial.
A, 7th, B, 8th, C, 10th, or 11th mag.
Measures of AB.

Position.		Distance. Parts.	
° ′ 60.40	S	14. 3	S
58.47	S	12. 5	S
60.17	S	14. 9	S
62.15	S	14. 2	S
61.45	S	14 .7	S
Mean = 60.45		Mean = 14.12	
		Z = − 0.73	
		13.39	

sp
Position = 60° 45′ *sp* S.
Distance = 4″.229.

90 Leonis continued.

Position.			Distance. Parts.	
° ′				
56.45	H	Position = 56° 43′ *sp* H.	10. 8	H
56.35		Distance = 3″.597.	11. 6	
55.53			13. 0	
57. 5			11. 5	
57.15			13. 7	
Mean = 56.43			Mean = 12.12	
			Z = − 0.73	
			11.39	

April 11, 1823.

Five-feet Equatorial.

Measures of AC.

Position.			Distance. Parts.	
° ′		*sp*		
37.50	H		197. 0	S
37.12			192. 5	
37.52			196. 0	H
38. 5	H	Position = 37° 3′ *sp*	193. 0	
35.55		Distance = 1′.1″.234.		
35.25				
Mean = 37. 3			Mean = 194.62	
			Z = − 0.73	
			193.89	

Mean result.

Position of AB 61° 8′ *sp*. *Distance* 4″.452; 1822.27
AC 36 41 *sp*. 1′.0″.753; 1822.27

In taking the mean, Mr. HERSCHEL's observations of April 11 are rejected for the pair AB. Other observations are,

1782.29, AB; 61° 9′ *sp*; Distance 1¼ or 1½ diam. of L; H. Catalogue of 1782.
1802.18, 59 44 *sp*; H. MS. mean of 3 measures.
1821.80; 63 54 *sp*; STRUVE, Dorp. Obs. iii. p. 135, 6 measures.
1783.39, AC; 35 12 *sp*; Distance 53″.72. H. Cat. of 1782.
1782.29, 35 5 *sp*; Ditto, MS.
1820.30, 37 42 *sp*; STRUVE, Dorp. Obs. iii. 3 meas.

No. CXXIX. R. A. 11h 38m; Decl. 21° 13′ N.

93 Leonis; STRUVE 393; VI. 80.

Large white; small bluish.

March 22, 1821.

Five-feet Equatorial.

np

Position.		Distance. Parts.	
° ′			
84.48	S	237. 8	S
85.40	S	238. 1	S
86.40	S	241. 0	S
86.32	H	232. 3	H
84.36	H	234. 8	H
88. 0	H	235. 6	H
Mean = 86.3*		Mean = 236.60	
		Z = — 0.08	
		236.52	

Position = 86°.3′ *np*
Distance = 1′.14″.698

Feb. 12, 1823.

Five-feet Equatorial.

6th and 10th magnitudes, or 5th and 10th.

Position.		Distance. Parts.	
° ′			
90—4.25	S	243. 2	S
4.10	S	240. 7	S
3.30	S	239. 3	S
4.12	S	238. 0	S
4.50	S	239. 0	S
4.45	S	242. 5	H
3.58	H	236. 0	H
2.45	H	240. 0	H
2. 5	H	236. 0	H
3.14	H	237. 5	H
3.20	H		
3.48	H		
Mean — 3.45		Mean = 239.22	
		Z = — 1.33	
		237.89	

Position = 86°.15′ *n p*
Distance = 1′.15″.130.

Small star bears very little illumination.

April 10, 1823.

Five-feet Equatorial.

n p

Position.		Distance. Parts.	
° ° ′			
90—3.20	S	238. 0	S
3.43	S	236. 5	S
3. 2	S	235. 5	S
3.22	S	239. 0	S
4.15	S	236. 2	S
Mean — 3.32		Mean = 237.04	
		Z = — 0.73	
		236.31	

Position = 86° 28′ *np*
Distance = 1′.14″.632.

Mean result.

Position 86° 15′ *np*. *Distance* 1′.14″.897; 1822.54.

The distance in 1782 was 1′.10″.22; H. Catalogue of 1785.

CXXX. R. A. $11^h\ 38^m$; Decl. $21°\ 2'$ N.

Nova (*s p* 93 Leonis.)

8th and 10th magnitudes.

April 10, 1823.

Five-feet Equatorial.

n f

Position. ° ′		Distance. Parts.	
66.14	H	230. 0	H
64.45	H	254. 0	H
66. 0	H	244. 0	H
64.46	H	238. 5	H
65.15	H	247. 0	H
65. 0	S	248. 0	H
65.20	S	245. 0	S
65. 0	S	244. 5	S
64. 0	S	243. 8	S
64.15	S	245. 5	S
		244. 8	S
Mean = 65. 3		Mean = 244.10	
		Z = − 0.73	
		243.37	

Position = $65°.3'$ *n f*
Distance = $1.16''.861$.

No. CXXXI. R. A. $11^h\ 39^m$; Decl. $9°\ 15'$ N.

ξ Virginis; STRUVE 394; VI. 113;

Triple; excessively unequal; small stars bear very little illumination; both north preceding. A, the bright star. B brighter than C, but more distant than it.

March 11, 1823.

Seven-feet Equatorial.

np

Measures of distance impracticable.

B bears a better illumination than C.

Measures of AB. ° ° ′		Measures of AC. ° ° ′	
90—86.30	H	90—36.30	S
86.41	H	36.42	S
86,40	H	36.40	S
86.35	H	36.45	S
86.28	H	36.50	S
Mean — 86.37		Mean — 36.41	

Angle of AB = $3°.25'$ *n p*. Angle of AC = $53°.19'$ *n p*.

No. CXXXII. R. A. $11^h\ 44^m$; Decl. 16° 26′ N.

(s p *o* 95 Leonis), STRUVE, 397; V. 60.

Extremely unequal; 7th and 10th magnitudes.

Position.	April 9, 1823.	Distance.
° ′	Five-feet Equatorial.	Parts.
75. 0 H	*nf*	122. 0 H
74.15 H		114. 0 S
78. 0 H		Mean = 118. 0
77. 0 S	Position = 75° 57′ *nf*	Z = − 0.49
76.30 S	Distance = 37″.112.	117.51
75. 0 S		
Mean = 75.57		

The measures are very difficult; those of distance merit but little confidence.

1783.09; Position 70° 48′ *nf.* Distance 37″.24. H. Cat. of 1785.

No. CXXXIII. R. A. $11^h\ 46^m$; Decl. 47° 29′ N.

65 Ursæ Majoris; STRUVE, 398; I. 72.

Double; pretty unequal.

Position.	April 28, 1821.	Distance.
° ° ′	Five-feet Equatorial.	Parts.
90—65.39 H	*sf*	196. 3 H
64.34 H		197. 0 H
64.37 H		197. 2 H
66. 5 H		199. 5 H
64.53 H		200. 7 H
67. 0 S		198. 5
65.50 S	Position = 24° 17′ *sf*	197. 3
66.20 S	Distance = 1′.2″.185	195. 0
66. 9 S		199. 5
66.10 S		199. 0
65.40 S		198. 0
Mean = 65.43		Mean = 197.01
		Z = − 0.11
		196.90

April 9, 1823.

Triple; AB close; extremely unequal; AC rather unequal; A, 7th magnitude; B, 11th; C, $7\frac{1}{2}$ magnitudes.

65 Ursæ Majoris continued.

Five-feet Equstorial.

Measures of AB

nf

Position.		Distance. Parts.	
° ′			
57.30	S	12. 5	S
56.45	S	15. 0	S
57. 0	S	14. 2	S
53.20	H	15. 0	S
54.15	H	14. 5	S
54.30	H	11. 0	H
56.26	H	10. 5	H
54.27	H	12. 5	H
55.37	S	13. 0	H
54.30	S	14. 0	H
Mean = 55.26		Mean = 13.22	
		Z = — 0.49	
		12.73	

Position $= 55° 26'$ *nf*
Distance $= 4''.020$.

The measures of April 28, 1821, are of AC,

1782.89; AB, Position 53° 45′ *nf*; very exact; Dist. 2 D. (about 4″); H. Cat. of 1785

AC, Position 22 21 *sf*; very exact; Dist. 1′.0″.07; H. ditto.

No. CXXXIV. R. A. 11^h 55^m; Decl. 22° 28′ N.

2 Comæ Berenices; STRUVE, 400; II. 47;

Considerably unequal; 7th and 7½ magnitudes; beautifully defined.

Feb. 21, 1823.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
32. 5	H	12. 0	H
31.56	H	11. 8	H
30.18	H	15. 0	H
30.25	H	14. 0	H
29.30	H	14. 1	H
30.12	H	14. 4	H
33. 0	S	15. 2	S
32.10	S	14. 5	S
31.28	S	13. 7	S
31. 5	S	14. 3	S
32. 0	S	14. 5	S
31.20	S	14. 0	S
30.45	S		
Mean = 31.15		Mean = 13 96	
		Z = — 2.29	
		11.67	

Position $= 31° 15'$ *sp*
Distance $= 3^{m}.685$.

2 Comæ Berenices continued.

1782.30; Position 27° 42′ *sp*; interval 2 D. H. Cat. of 1785
The interval of 2 diameters corresponds to a distance about 4″

1820.56; 35 8 *sp*; STRUVE, Dorp. Obs. iii. by 6 measures.

CXXXV. R. A. $12^h\ 3^m$; Decl. 54° 28′ N.

STRUVE, 403; H. C. 354;

Nearly equal; 7th and 7¼ magnitudes.

March 21, 1823.

Five-feet Equatorial.

s p

Position. ° ′		Distance. Parts.
47. 5		39. 2
45.50		39. 5
45. 0 S		40. 3 S
46.10		39. 2
47.30		37. 0
Mean = 46.19		Mean = 39. 04
		Z = — 0. 72
		38. 32

Position = 46°.19′ *sp*
Distance = 12″.102.

CXXXVI. R. A. $12^h\ 3^m$; Decl. 82° 43′ N.

207 BODE, Camelopardali;

Double; 6th and 8½ magnitudes.

May 7, 1823.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.
13.35		202. 0
13.25		200. 4
12.55 S		201. 6 S
13.40		200. 8
13. 5		201. 2
12.55		200. 6
Mean = 13.16		Mean = 201.10
		Z = — 0.21
		200.89

Position = 13°.16′ *nf*
Distance = 1′.3″.445.

CXXXVII. R. A. $12^h\ 6^m$; Decl. $6°\ 15'$ S.

STRUVE, 406; H. C. 152;

Nearly equal; 8th magnitude.

May 21, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
° ° ′ 90—71.16		31. 0	S
72.30		29. 0	S
73.30		29. 3	S
71.35		30. 6	S
70 0		29. 8	S
72.15		29. 9	S
Mean — 71.51		Mean = 29.93	
		Z = — 0.72	
		29.21	

Position $= 18°.9'$ *np*
Distance $= 9''.225$.

No. CXXXVIII. R. A. $12^h\ 7^m$; Decl. $41°\ 40'$ N.

2 Canum Venaticorum; STRUVE, 407; III. 85;

Large red, or ruddy; the small positively blue; although the small star is very faint without illumination, yet it is perfectly distinct with all the light afforded by the lamp.

March 25, 1821.
Five-feet Equatorial.
sp

Position.		Distance. Parts.	
° ′ 10.10	H	35. 0	H
9.44	H	39. 4	H
10.32	H	36. 8	H
8.55	H	38. 5	H
9.50	S	34. 0	S
10. 5	S	35. 5	S
10.14	S	34. 5	S
Mean = 9.56		Mean = 36.24	
		Z = — 0.08	
		36.16	

Position $= 9°\ 56'$ *sp*.
Distance $= 11''.421$.

2 Canum Venaticorum continued.

Feb. 23, 1823.

Five-feet Equatorial.

sp

5th and 12th magnitudes.

Position.		Distance. Parts.	
° ′ 10.12	S	40. 0	S
9.30	S	38. 8	S
10.14	S	38. 2	S
9.45	S	40. 1	S
11.20	S	40. 0	S
10.52	S	38. 0	H
11. 4	H	40. 0	H
11. 2	H	40. 8	H
11.38	H	39. 2	H
12.29	H	42. 4	H
11. 0	H		
Mean = 10.50		Mean = 39.75	
		Z = − 2.98	
		36.77	

Position = 10°.50′ *sp*
Distance = 11″.613.

Mean result.

Position 10° 29′ *sp.* *Distance* 11″.534; 1822.18.

Other measures are,

1783.34; Position 11° 0′ *sp*; Distance 12″.20; H. Catalogue of 1785.

1819.64; 8 9 *sp*; 3 meas. STRUVE, Dorp. Obs. ii. Observations, &c. No. 75.

1819.74; 11 8 *sp*; 5 measures. Ditto, No. 114, page 166.

The mean of M. STRUVE'S measures is 10° 1′, agreeing almost exactly with our own.

No. CXXXIX. R. A. 12ʰ 8ᵐ; Decl. 81° 6′ N.

STRUVE, 408;

Nearly equal; 6½ and 6¾ magnitudes.

May 21, 1823.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′ 51.48	S	52. 2	S
48.50	S	49. 0	S
48.55	S	47. 9	S
50.30	S	49. 5	S
49.30	S	48. 8	S
51.40	S	49. 3	S
Mean = 50.15		Mean = 49.45	
		Z = − 0.72	
		48.73	

Position = 50°.15′ *sp*
Distance = 15″.389.

No. CXL. R. A. $12^h\ 9^m$; Decl. $2°.56'$ S.

(22 of the 145); STRUVE, 409; PIAZZI XII. 32, 33;

Double; 6th and 7th magnitudes.

April 19, 1823.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° '			
73. 1	H	67. 5	H
74. 8	H	68. 2	H
74. 0	H	68. 1	H
72.30	H	68. 0	H
72. 0	H	66. 0	H
73.30	S	67. 0	S
72.45	S	69. 5	S
73.25	S	68. 0	S
73.50	S	68. 2	S
73.42	S	67. 4	S
Mean = 73.17		Mean = 67.87	
		Z = − 1.45	
		66.42	

Position $= 73°.17'$ *sp*
Distance $= 20'',976$.

Stars perfectly steady; measures very satisfactory.

April 22, 1823.

Five-feet Equatorial.

sp

7 and $7\frac{1}{2}$ magnitudes.

Position.		Distance. Parts.	
° '			
71.30	H	66. 5	H
71.29	H	68. 0	H
71.30	H	68. 2	H
73. 0	H	70. 0	H
72.32	H	67. 1	H
72.41	S	70. 0	S
72.15	S	69. 0	S
72. 7	S	69. 3	S
71 17	S	68. 0	S
72.33	S	68. 6	S
Mean = 72. 5		Mean = 68.47	
		Z = − 1.81	
		66.66	

Position $= 72°.\ 5'$ *sp*
Distance $= 21''.052$

May 6, 1823.

Five-feet Equatorial.

Position.	
° '	
66. 6	Mr. RICHARDSON.
66. 0	
65. 5	
67. 7	
67. 0	
65. 5	
66. 3	
67. 2	
Mean = 66.47	
Z = − 0.01	
66.46	

Distance $= 20''.989$.

(22 of the 145) continued.

May 4, 1823.

Five-feet Equatorial.

7th and $7\frac{1}{8}$ magnitudes.

sp

Position.		Distance. Parts.	
° ′			
73.50	S	67. 0	S
74.15	S	68. 0	S
74. 0	S	66. 5	S
73.52	S	69. 5	S
73.23	S	67. 8	S
73.10	H	63. 0	H
73.25	H	63. 5	H
73.10	H	68. 0	H
72.55	H		
Mean = 73.33		Mean = 66.67	
		Z = − 0.01	
		66.66	

Position = 73°.33′ *sp*
Distance = 21″.052

Mean result.

Position 72° 58′ *sp*. Distance 21″.017 : 1823.33.

No. CXLI. R. A. $12^h 12^m$; Decl. 28°.5′ N.

(55 BODE Comæ Berenices, and 31 of the 145).

Very nearly or perhaps quite equal; both bluish white.

March 14, 1821.

Five-feet Equatorial.

sp or *nf*

Position.		Distance. Parts.	
° ′			
26. 8	S	32. 0	S
20.16	S	34. 8	S
23.24	H	35. 5	S
23.30	H	32. 8	H
25.30	H	33. 1	H
		34. 0	H
Mean = 23.46		Mean = 33.70	
		Z = − 3.16	
		30.54	

Position = 23°. 46′ *sp* or *nf*
Distance = 9″.646

April 10, 1823.

Five-feet Equatorial.

$7\frac{1}{4}$ and $7\frac{1}{2}$ magnitudes.

nf

Position.		Distance. Parts.	
° ′			
21.28	H	33. 5	H
25. 4	H	29. 9	H
23.40	H	31. 4	H
21.32	H	32. 9	H
22.30	H	34. 0	H
23.31	H	29. 8	H
23.31	S	35. 0	S
24.10	S	33. 2	S
23.28	S	32. 2	S
23.20	S	32. 7	S
23. 2	S	32. 0	S
Mean = 23.12		Mean = 32. 42	
		Z = − 0.73	
		31.69	

Position = 23°.12′ *nf*
Distance = 10″.007.

(55 Bode Comæ Berenices, and 31 of the 145) continued.

April 19, 1823.
Five-feet Equatorial.
sp

Position (° ′)		Distance (Parts)	
23.33	H	31. 3	H
25.10	H	30. 2	H
23.15	H	29. 8	H
24. 0	H	29. 6	H
25. 0	H	28. 7	H
25. 0	S	29. 5	H
24.32	S	30. 2	S
24.15	S	29. 3	S
23.59	S	28. 7	S
23.25	S	27. 8	S
		28. 8	S
Mean = 24.13		Mean = 29.45	
		Z = — 1.45	
		28.00	

Position $= 24°.13'$ *sp*
Distance $= 8''.843$.

Mean result.

Position 23° 42′ *sp*; *Distance* 9″.453; 1822.59.
1820.56; *Position* 27° 36′ *sp*; Struve, Dorpat Obs. iii. by 5 measures.

The angles agree very well; but the distances are altogether unsatisfactory. The night of April 10, was one of rare occurrence for the steadiness and exact definition of the stars; and the measure 10″.007 of that night, supported as it is by that of March 14, 1821, ought, not improbably, to be preferred, to the rejection of that of April 19, though nothing appears on the face of the observations to invalidate the latter.

No. CXLII. R. A. $12^h\ 13^m$; Decl. 6° 19′ N.
17 Virginis; Struve 411; IV. 50;
Extremely unequal; 7 and 12 magnitudes.

Feb. 23, 1823.
Five-feet Equatorial.
np

Position (° ° ′)		Distance (Parts)	
90—19.33	H	75. 0	H
20.52	H	73. 0	S
20.58	H	72. 0	S
20.40	H	74. 0	S
21.45	H	Mean = 73.50	
22. 0	S	Z = — 2.98	
21.35	S	70.52	
22. 3	S		
22.10	S		
21.58	S		
Mean = — 21.21			

Position $= 68°\ 39'$
Distance $= 22''.272$.

Measures of distance extremely difficult.

17 Virginis continued.

April 7, 1823.
Five-feet Equatorial.
7 and $9\frac{1}{2}$ magnitude.
np

Position.		Distance. Parts.	
° ° ′			
90—19.28	H	66. 0	H
19.40	H	59. 0	H
19. 0	H	63. 0	H
18.10	H	65. 2	H
20.40	H	67. 0	H
20.27	S	64. 5	S
22. 0	S	63. 4	S
19.35	S	64. 7	S
19. 0	S	64. 8	S
19.45	S		
Mean — 19.46		Mean = 64.18	
		Z = + 0.24	
		64.42	

Position = 70° 14′ *np*
Distance = 20″.344.

Measures difficult.

Mean result. Position 69° 36′ *np* ; *Distance* 29″.937 ; 1823.20.

This position agrees ill with that of Sir W. HERSCHEL, whose measures (Catal. of 1785) are, Position 58° 21′ *np* : Distance 20″.15. The change is such as the proper motions assigned to the large star in PIAZZI'S Catalogue would lead us to expect, though less in its amount.

No. CXLIII. R. A. 12^h 13^m ; Decl. 26° 51′ N.

12 Comæ Berenices ; STRUVE 412 ; V. 121.

Double ; extremely unequal ; large white, small red.

May 21, 1821.
Five-feet Equatorial.
sf

Position.		Distance Parts.	
° ° ′			
90— 9.51	H	212. 0	H
12. 0	H	211. 0	H
11.29	H	211. 1	H
10.22	H	208. 5	H
11.24	S	207. 9	S
11.39	S	207. 1	S
11.33	S	206. 2	S
11.30	S	207. 0	S
		209. 0	H
Mean = 11.13		Mean = 208.87	
		Z = — 0.05	
		208.82	

Position = 78° 47′ *sf*
Distance = 1′ 5″.950

1783.08 ; Position 77° *sf* ; Distance 58″.91 ; H. Cat. of 1785.

No. CXLIV. R. A. $12^h\ 19^m$; Decl. $45°\ 50'$ N.
(H C 385); Struve, 413;
Nearly equal; 7th and $7\frac{1}{4}$ magnitudes.

May 21, 1823.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
90°—18°.28'	S	35. 3	S
18.15	S	35. 5	S
17. 8	S	36. 2	S
16.25	S	35. 5	S
16. 0	S	35. 5	S
16.45	S	36. 0	S
Mean — 17.10		35.67	
		Z = — 0.72	
		34.95	

Position = 73° 50′ *sf*
Distance = 11″.038.

June 5, 1823.
Five-feet Equatorial.
8th and $8\frac{1}{2}$ magnitudes.
sf

Position.		Distance. Parts.	
90°—18°. 0'	H	36. 2	H
17.50	H	38. 0	H
16.45	H	36. 1	H
16.45	H	37. 1	H
15.55	H	35. 5	H
17.18	H	35. 6	H
Mean — 17. 6		Mean = 36.42	
		Z = — 1.21	
		35.21	

Position = 73° 54′ *sf*
Distance = 11″.120.

Mean result.
Position 73° 52′ *sf*; *Distance* 11″.079. *Epoch* 1823.39.

No. CXLV. R. A. $12^h\ 21^m$; Decl. $15°\ 30'$ S.
δ Corvi; Struve, 415; IV. 105;
Double; $4\frac{1}{2}$ and 9th magnitudes.

April 10, 1823.
Five-feet Equatorial.
sp

Position.		Distance. Parts.	
57°.15'	H	75. 3	H
55.34	H	75. 6	H
57. 0	H	74. 0	H
56. 0	H	77. 0	H
55.15	H	78. 3	S
56.30	S	76. 5	S
57.22	S	77. 8	S
55.35	S	77. 3	S
56.47	S	78. 0	S
57.13	S	77. 6	S
Mean = 56.27		Mean = 76.74	
		Z = — 0.73	
		76.01	

Position = 56° 27′ *sp*
Distance = 24″.005.

Stars exquisitely defined.

δ Corvi continued.

1783.04; Position 54° 0′ *sp*; Distance 23″.50; H. Cat. of 1785.
1802.24; 54 18 *sp*; H. MS.
1821.33; 60 3 *sp*; STRUVE, Dorp. Obs. iii. 5 meas.
This star, therefore, has undergone no sensible change.

No. CXLVI. R. A. 12h 22m; Decl. 2° 20′ N.

(H C 231); STRUVE, 416.

Double; 7 and $8\frac{1}{2}$ magnitudes.

May 21, 1823.
Five-feet Equatorial.
np

Position.	Distance. Parts.
° ° ′	
90—70.35 S	156. 5 S
70.10	159. 0
71. 7	157. 7
71.10	156. 8
70.45	158. 0
Mean = —70.45	Mean = 157.60
	Z = — 0.72
	156.88

Position = 19° 15′ *np*
Distance = 49″.546.

June 12, 1823.
Five-feet Equatorial.
np

Position.	Distance. Parts.
° ° ′	
90—70.50 H	159. 0 H
70.32	158. 5
70.38	157. 5
70.20	
70.48	
Mean — 70.38	Mean = 158.33
	Z = + 0.23
	158.56

Position = 19° 24′ *np*
Distance = 50″.077.

Mean result.

Position 19° 39′ *np*; *Distance* 49″.745; *Epoch* 1823.42.

No. CXLVII. R. A. $12^h\ 25^m$; Decl. $75^\circ\ 46'$ N.

(118 of the 145.)

April 22, 1823.

Seven-feet Equatorial.

nf

Distance. Parts.		Position. ° ′	
63.30	H	27. 8	H
68. 0	H	24. 3	H
66.10	H	27. 3	H
69.20	H	24. 8	H
71.10	H	25. 9	H
65. 0	S	24. 0	S
64.30	S	26. 2	S
67.55	S	23. 0	S
67.30	S	24. 0	S
68.35	S	26. 3	S
Mean = 67.10		Mean = 25.36	
		Z = − 0.97	
		24.39	

Position $= 67^\circ\ 10'$ *nf*

Distance $= 5''.865$

A very difficult star to measure.

No. CXLVIII. R. A. $12^h\ 26^m$; Decl. $19^\circ\ 22'$ N.

24 Comæ Berenices; STRUVE, 417; IV. 27;

Large, ruddy; small, decidedly of a green colour. The contrasted colours of the stars render this a beautiful object.

March 14, 1821.

np

Position. ° ′		Distance. Parts.	
2. 35	S	67. 1	S
2. 0	S	70. 0	S
0. 30	S	69. 9	S
1. 25	H	67. 0	H
2. 29	H	70. 0	H
2. 14	H	71. 2	H
Mean = 1. 52		Mean = 69.20	
		Z = − 3.16	
		66.04	

Position $= 1^\circ\ 52'$ *np*

Distance $= 20''.857$

24 Comæ Berenices continued.

April 10, 1823.

Large, white; small, a beautiful blue or green.

Five-feet Equatorial.

np

6 and 7 magnitudes.

Position.		Distance Parts.	
° ° ′			
90—88. 5	S	63. 9	S
87.37	S	63. 2	S
89.15	S	65. 0	S
87.20	S	67. 5	S
87.52	S	66. 7	S
87.10	H	63. 5	H
87.20	H	66. 2	H
87. 5	H	68. 0	H
87. 3	H	66. 0	H
88.30	H	67. 1	H
Mean = — 87.44		Mean = 65.71	
		Z = — 0.73	
		64.98	

Position = 2°.16′ *n p*
Distance = 20″.521.

Mean result.

Position 2° 7′ *np*; *Distance* 20″.647; *Epoch* 1822.24.

1782.30; Position 3° 28′ *np*; Distance 20″.60; H. Catal. of 1782. The distance 18″.24‴, given in the Catalogue, is a mean of 20″.60, and 16″.20; the latter however should be rejected, the measure being marked as imperfect.

1820.56; Position 3° 24′ *np*; STRUVE, Dorp. Obs. iii. 5 meas.

No. CXLIX. R. A. 12^h 32^m; Decl. 12° 1′ S.

58 BODE Corvi; (38 of the 145);

Double; 7th and 7½ magnitudes.

April 22, 1823.

Five-feet Equatorial.

sf

Position.		Distance. Parts.	
° ° ′			
90—58.53	H	24. 5	S
61.32	H	24. 8	S
59.50	H	24. 9	S
60.25	H	23. 3	S
59.15	H	24. 8	S
60.30	S	23. 6	H
61. 5	S	22. 1	H
61.30	S	21. 6	H
61.25	S	22. 7	H
61.15	S	23. 7	H
Mean — 60 34		Mean = 23.60	
		Z = — 1.81	
		21.79	

Position = 29° 26′ *sf*
Distance = 6″.881.

No. CL. R. A. $12^h\,33^m$; Decl. $0°\,27'$ S.

γ Virginis; Struve, 420; III. 18;

A very beautiful double star; both white and equal.

March 22, 1821.

Five-feet Equatorial.

sf

Position.		Distance. Parts.	
° ′			
14.55	S	12. 7	S
14.26	S	13. 0	S
14.30	S	15. 0	S
14.30	H	14. 9	H
15.17	H	14. 2	H
14.36	H	14. 4	H
Mean = 14.42		Mean = 14. 3	
		Z = − 0.08	
		13.95	

Position = 14°.42′ *sf*
Distance = 4″.406.

April 10, 1823.

Five-feet Equatorial.

very nearly equal.

sf

Position.		Distance. Parts.	
° ° ′			
90—76.45	H	11. 0	H
78.55	H	9. 0	H
78.50	H	11. 7	H
78. 0	H	12. 0	H
76.45	H	11. 0	H
75.50	S	11. 9	S
77. 2	S	13. 8	S
77.23	S	12. 3	S
77. 6	S	11. 7	S
77 11	S	11. 4	S
Mean = — 77.23		Mean = 11.58	
		Z = − 0.73	
		10.85	

Position = 12° 37′ *sf*
Distance = 3″.427.

Mean Position 13° 24′ *sf*. *Distance* 3″.794. *Epoch* 1822.25.

Other measures are,

1720.31	Position 49° 7′ *np*;	Cassini, by an occultation of γ by the moon, computed by M. Walbeck.—Zach. Corr. Ast. viii. 517.
1756. 0	54 22 *np*;	H. Account of Changes, &c. computed from the right ascension and declination in Mayer's Catalogue.
1781.89	40 44 *sf*;	H. Catalogue of 1782
1803.20	30 19 *np*;	Ditto, mean of 6 measures in 1802, 1803.
1820.20	15 15 *np*;	Struve, Additamenta, 178.

γ Virginis continued.

1720.31	Distance = 7″. 49	CASSINI.
1756. 0	6. 50	TOBIAS MAYER.
1780. 0	5. 70	H. The measures of the Cat. for 1782, with allowance for the diameters of the stars.
1820. 0	3. 56	STRUVE, Additamenta.
1822.25	3. 794	H. and S. ut supra.
1823.19	3. 300	AMICI, ZACH. viii. 217.

This star appears to have undergone a very remarkable diminution of distance, and at the same time a material increase in the mean motion of its component stars one about the other. The computed occultation of CASSINI in 1720 cannot have any dependance placed on it, as the lunar tables can hardly be supposed correct enough to carry us back 100 years from the present time, with the precision necessary for so delicate an object, unless corrected for that express purpose by some observations made about the time; and it may fairly be doubted whether the necessary degree of accuracy for such observations could then be attained. If we reject this, we shall find that a mean motion of 0°.667 per annum in the direction *np sf* (or retrograde) will nearly represent the measures, as the following statement will show.

Date.	Observed Position.	Calculated Position.	Difference.
1756.0	54°.4 *np*	57°.6 *np*	−3°.2
1781.9	40 .7	40 .3	+0 .4
1803.2	30 .3	26 .2	+4 .1
1820.2	15 .3	14 .8	+0 .5
1822.3	13 .4	13 .4	0 .0

The differences are no greater than may well be attributed to error of observation, while the whole amount of the

γ Virginis continued.

angular motion observed being no less than 41°, places the fact of a great change beyond dispute. In the first 25.9 years of this period the angle described was 13°.64; in the next 21.3 years, 10°.41 were described; in the next 17.0, the change was 15°.06; and in the last 2y.1, 1°.86. The respective mean annual motions corresponding to which are 0°.527, 0°.489, 0°.886 and 0°.886. The change of distance is more than sufficient to account for the acceleration on the supposition of an elliptic orbit. The star is a very interesting one, and deserves to be narrowly watched.

No. CLI. R. A. 12h 36m; Decl. 2° 54′ S.

STRUVE, 421; III. 53;

Double; 7th and 8th magnitudes.

Position.	May 23, 1823.	Distance. Parts.
° ° ′	Five-feet Equatorial.	
90—12. 8	*n p*	52. 2
11.35		50. 3
10.30 } S		53. 7 } S
11.46	Position = 78° 22′ *np*	52. 8
12.20	Distance = 16″.261	54. 5
11.30		
Mean — 11.38		Mean = 52.70
		Z = — 1.21
		51.49

Position.	June 5, 1823.	Distance. Parts.
° ° ′	Five-feet Equatorial.	
90—11.35	7 and 8 magnitudes.	57. 8
12.15	*n p*	54. 6
12.29 } H		56. 1 } H
11.15		55. 0
11.42	Position = 78° 9′ *n p*	56. 0
Mean = — 11.51	Distance = 17″.271	Mean = 55.90
		Z = — 1.21
		54.69

Measures taken when the stars were 2h 24m west of meridian, but are beautifully defined. (H.)

STRUVE, 421; III. 53 continued.

Mean result.

Position 78° 15′ *np*; *Distance* 16″.766; 1823.41.

Other measures,

Position 79° 0 *np*; Distance 12″.97; 1783.33; H. Cat. 1785.
75 28 *np*; 1802.31; H. MS.

No. CLII. R. A. $12^h\ 40^m$; Decl. 4° 48′ N.

(H. C. 230); STRUVE, 422;

Double; 8½ and 8¾ magnitudes; bear but a very slight illumination.

May 23, 1823.

Seven-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
75. 0	S	46. 6	S
76.35		40. 4	
74.52		43. 0	
75.40		43. 3	
76.42		44. 5	
75. 0		42. 3	
Mean = 75.38		Mean = 43.35	
		Z = − 1.31	
		42.04	

Position = 75° 38′ *sp*
Distance = 10″.109

No. CLIII. R. A. 12h 43′; Decl. 20° 9′ N.

STRUVE, 423; IV. 58; PIAZZI, 12; 202;

Nearly equal; 7¼ and 7½ magnitudes.

May 18, 1823.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
67.30	S	53. 0	S
68.30		54. 9	
70. 0		55. 7	
67.45		55. 5	
68.25		54. 0	
Mean = 68.26		Mean = 54.62	
		Z = − 0.35	
		54.27	

Position = 68° 26′ *sp*
Distance = 17″.139

STRUVE, 423; IV. 58; continued.

June 12, 1823.
Five-feet Equatorial.
7 and $7\frac{1}{2}$ magnitudes.
sp

Position.		Distance. Parts.	
° ′			
66.30	H	50. 7	H
67.10		54. 3	
67.15		55. 6	
67.30		52. 3	
66.50		51. 7	
68. 4			
Mean = 67.13		Mean = 52.92	
		Z = + 0.23	
		53.15	

Position = 67° 13′ *sp*
Distance = 16″.787

A 3rd star; Position = 59° 23′ *np*; Distance 4′ 9″.666 } Single measures.
A 4th star; Position = 4 0 *sp*; Distance 10 31 .644 }

Mean result. Position 67° 49′ *sp*; *Distance* 16″.963; 1823.41.
Other measures. 67 57 *sp*; 15 .860; 1783.15; H. Cat. of 1785.

No. CLIV. R. A. $12^h\ 44^m$; Decl. 22° 14′ N.
35 Comæ Berenices; STRUVE, 425; V. 130.

Double; small star extremely faint; so much so that it has been overlooked in former observations. Large, white; small, bluish.

May 4, 1821.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
° ° ′			
90—47. 0	H	92. 0	S
50.30		97. 5	
49. 0		90. 5	H
49.15		94. 0	
53.25	S	Mean = 93.50	
53.45		Z = − 0.11	
53.40		93.39	
54.22			
53. 0	H		
53. 7			
Mean = 51.42			

Position = 38° 18′ *sf*
Distance = 29″.494

Other measures.

Position 36° 51′ *sf*; Distance 31″.29; 1783.15; H. Cat. of 1785.

No. CLV. R. A. $12^h\ 44^m$; Decl. $16^\circ\ 0'$ N.

(H. C. 73); STRUVE, 424;

Very nearly equal; 8th and $8\frac{1}{2}$ magnitudes.

Position.	June 6, 1823.	Distance. Parts.
° ′	Seven-feet Equatorial.	
78.45 } S	*sp* or *nf*	34. 4 } S
81.22		30. 5
80.15		36. 0
79.12	Position = 79° 53′ *sp* or *nf*	
Mean = 79.53	Distance = 7″.995.	Mean = 33.63
		Z = − 0.38
		33.25

Measures gotten when the stars were only visible by glimpses; the angles however are not bad, but the distances are somewhat dubious. S.

No. CLVI. R. A. $12^h\ 46^m$; Decl. $3^\circ\ 54'$ S.

STRUVE, 426; II. 42;

Double; large white, small blue; 7th and 10th magnitudes; bear but a very feeble illumination; the measures are difficult.

Position.	May 23, 1823.	Distance. Parts.
° ° ′	Seven-feet equatorial.	
90—28.15 } S	*sf*	28. 2 } S
31.20		31. 0
28.55		29. 8
29.25		29. 3
30.30	Position = 60° 19′ *sf*	28. 8
Mean — 29.41	Distance = 6″.758.	Mean = 29.42
		Z = − 1.31
		28.11

Other measures,

Position 52° 24′ *sf*; Interval $2\frac{1}{2}$ D; 1783.18; H. Cat. of 1785.
54 26 *sf*; 1802.31; Ditto. MS.
62 6 *sf*; by 4 measures; 1821.33; STRUVE, Dorp. Obs. iii.

The angle appears liable to a slow variation, but the distance does not seem to have changed materially, so far as one can judge from the estimation in diameters.

No. CLVII. R. A. $12^h\ 47^m$; Decl. $12°\ 29'$ N.

Struve, 427; Piazzi XII. 221;

Double; large white, small blue; small star does not bear a good illumination; 6th and 9th magnitudes: the measures are difficult.

Position.	May 23, 1823. Seven-feet Equatorial. *sp*	Distance. Parts.
° ′		
73.15 S		120. 3 S
75.20		123. 8
73.45		122. 3
72.30		123. 0
73. 5	Position = 73° 43′ *sp*	122. 9
74.25	Distance = 29″.170	123. 5
Mean = 73.43		Mean = 122.63
		Z = − 1.31
		121.32

No. CLVIII. R. A. $12^h\ 48^m$; Decl. $39°\ 18'$ N.

12 Canum Venaticorum; Struve, 428; IV. 17;

Very unequal; large white; small plum colour; 3d and 7th magnitudes.

Position.	March 12, 1821. Five-feet Equatorial. *s p*	Distance. Parts.
° ′		
44.26		64. 8
43.23		64. 0
42.30		67. 5
42. 0		71. 0
41. 0	Position = 42° 40′	70. 0
Mean = 42.40 *	Distance = 20″.307.	Mean = 67.46
		Z = − 3.16
		64.30

Position.	April 9, 1823. Five-feet Equatorial. *sp*	Distance. Parts.
° ′		
43.28 H		61. 4 H
43.26		60. 3
42. 0		61. 5 S
44. 0 S		62. 2
43.45	Position = 43° 25′ *sp*	Mean = 61.35
43.50	Distance = 19″.221	Z = − 0.49
Mean = 43.25		60.86

12 Canum Venaticorum continued.

Mean result.

Position 43° 2′ *sp* ; *Distance* 19″.764 ; 1822.23.

Other observations,

*Pos.*ⁿ 41° 47′ *sp* ;	1782.30 ;	*Dist.* 20″. 0 ;	H. Cat. of 1782.
46 27 *sp* ;	1819.66 ;	19 .87 ;	STR. Addi. &c. p. 186.
	1821.67 ;	19″.94 ;	STRUVE, Astron. Nachrichten, No. 22.

This fine double star appears therefore to have undergone no change whatever.

No. CLIX. R. A. $12^h\ 48^m$; Decl. 55° 1′ N.

STRUVE, 430 ;

8th and 10th magnitudes; large, white; small, blue decidedly; it is a miniature of ε Bootis, and is at least as difficult of measurement; no advantage is gained by using a higher magnifying power than we generally employ, which is 133.

May 7, 1823.

Five-feet Equatorial.

n p

Position.		Distance. Parts.	
° ° ′			
90—79.30	S	10. 8	S
78.35	S	11. 7	S
80. 5	S	12. 6	S
80.35	S	10. 8	S
79.45	S	12. 5	S
79.35	S	11. 7	S
Mean — 79.41		Mean = 11.68	
		Z = — 0.21	
		11.47	

Position = 10° 19′ *np*
Distance = 3″.622.

STRUVE, 430; continued.

June 12, 1823.
Seven-feet Equatorial.
np

Position.	Distance. Parts.
° ° ′	
90—75.14	16. 2
72.40	15. 1
69.30	14. 2
67.30	15. 7
71.50	12. 0
71.20	
75. 0	
H	H
Mean = 71.52	Mean = 14.64
	Z = + 0.23
	14.87

Position = 18° 8′
Distance = 3″575

June 18, 1823.
Five-feet Equatorial.
np

Position.	Distance. Parts.
° ° ′	
90—75.35	13. 0
73.15	11. 3
76. 2	14. 8
76.40	13. 5
76. 0	14. 0
74. 0	14. 8
76 45	
76. 0	
S	S
Mean — 75.32	Mean = 13.57
	Z = — 0.36
	13.21

Position = 14°28′ *np*
Distance = 4″.172

Excessively difficult. S.

June 18, 1823.
Five-feet Equatorial.
np

Position.	Distance. Parts.
° ° ′	
90—74.40	16. 5
73.35	17. 0
71.25	16. 0
72.45	17. 6
73. 0	16. 4
71. 0	17. 0
71. 0	
H	H
Mean — 72.29	Mean = 16.75
	Z = — 0.36
	16.39

Position = 17° 31′ *np*
Distance = 5″.176

Quite as difficult, if not more so, than ε Bootis. H.

Mean result.

Position 15° 15′ *np*; *Distance* 4″.136; *Epoch* 1823.43.

No. CLX. R. A. $13^h\ 1^m$; Decl. $4^\circ\ 34'$ S.

θ Virginis; STRUVE, 432; III. 50;

Triple; the small close star is a very severe test for a telescope; it bears a strong illumination, however, though exceedingly faint, and is even better seen for it. The distant star does not bear illumination, on which account no measures of distance could be procured.

March 27, 1821.

Five-feet Equatorial.

Measures of AB.

np

Position.		Distance. Parts.
$90^\circ - 12^\circ.40'$	H	25. 5 H
14. 1	H	28. 0 S
10. 0	H	24. 0 H
13. 5	H	28. 0 S
14.20	S	Mean = 26.37
13.38	S	Z = − 0.08
12.20	S	26.29
Mean − 12.52		

Position = $77^\circ\ 8'$ *np*

Distance = $8''.301$.

Measures of AC

np

Position.	
$90^\circ - 66^\circ.50'$	H
65.45	H
65.15	H
Mean − 65.57	

Position = $24^\circ\ 3'$ *np*.

Other measures.

Position of AB $69^\circ\ 18'$ *np*; *Distance* $7''.13$; 1782.99; H. 2d Cat.
71 10 *np*; 1802.31; Ditto. MS.

No. CLXI. R. A. $13^h 4^m$; Decl. 17° 51′ N.

54 Virginis; STRUVE, 433; II. 45;

Nearly equal; 7th and $7\frac{1}{2}$ magnitudes.

April 9, 1823.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
56. 0	H	23. 0	H
54.30	H	21. 0	H
56.40	H	23. 2	H
54.30	H	22. 8	H
57.50	S	21. 4	H
55.30	S	20. 0	S
56.40	S	21. 3	S
58.12	S	22. 2	S
56.40	S	22. 0	S
		22. 5	S
Mean — 56.17		Mean = 21.94	
		Z = − 0.49	
		21.45	

Position = 56°.17′ *nf*
Distance = 6″.774.

1783.18. Position 57° 0′ *nf*; Interval $1\frac{1}{2}$ or $1\frac{3}{4}$ D. H. Cat. 1785.
1802.31. 54 34 *nf*; Do. MS.
1821.33. 60 0 *nf*; STRUVE, Dorp. Obs. iii. 2 meas.

The distance has undergone an obvious increase.

No. CLXII. R. A. $13^h 6^m$; Decl. 10° 24′ S.

STRUVE, 434; PIAZZI, XIII. 25;

Double; 7th and 8th magnitudes.

May 7, 1823.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
28.24	S	141. 5	S
27.56	S	143. 0	S
28.36	S	142. 5	S
28.13	S	144. 0	S
28.10	S	144. 5	S
28.45	S	142. 0	S
Mean = 28.21		Mean = 142.92	
		Z = − 0.21	
		142.71	

Position = 28° 21′ *nf*
Distance = 44″.847.

No. CLXIII. R. A. $13^h\ 15^m$; Decl. $3°\ 38'$ N.
(H. C. 506); STRUVE, 438;
As nearly equal as possible; $7\frac{1}{2}$ magnitude.

May 16, 1823.
Five-feet Equatorial.
sp or *nf*

Position.	
° ′	
14.20	S
12.15	S
14.15	S
13.20	S
14. 4	S
14.30	S
Mean = 13.47	

Position = 13° 47′ *sp* or *nf*

May 17, 1823.
Five-feet Equatorial.

Position.		Distance. Parts.	
° ′			
12.15	S	91. 2	S
13.20	S	89. 0	S
13.30	S	92. 0	S
14. 5	S	90. 2	S
13.45	S	90. 0	S
Mean = 13.29		Mean = 90.48	
		Z = − 0.35	
		90.13	

Position = 13° 29′ *sp* or *nf*
Distance = 28″.465.

Mean result.

Position 13° 39′ *nf* or *sp*; *Distance* = 28″.465; 1823.37.

No. CLXIV. R. A. $13^h\ 17^m$; Decl. $55°\ 52'$ N.
ζ Ursæ Majoris; STRUVE, 439; III. 2.
Pretty unequal; large, white; small, bluish.

March 15, 1821.
sf

Position.		Distance. Parts.	
° ′			
55.25	S	48. 0	S
57.35	S	49. 2	S
57.15	S	51. 1	S
58.20	H	48. 0	H
56. 0	H	46. 5	H
55. 5	H	49. 0	H
Mean = 56.37		Mean = 48.63	
		Z = − 3.16	
		45.47	

Position = 56° 37′ *sf*
Distance = 14″.360

ζ Ursæ Majoris continued.

April 9, 1823.

Five-feet Equatorial.

sf

3 and $4\frac{1}{2}$ magnitudes.

Position.	
90°—33°.49′	S
31.45	S
32.12	S
30.54	S
32. 4	S
31. 0	S
31.10	H
31.30	H
30.50	H
31.20	H
31.15	H
Mean — 31.37	

Position = 58° 23′ *sf*

Distance = 14″.487

Distance. Parts.	
48. 8	S
49. 2	S
49. 8	S
43. 5	S
48. 5	S
45. 5	S
46. 0	S
44. 0	H
49. 0	H
46. 5	H
46. 7	H
44. 5	H
47. 2	H
44. 0	H
46. 0	S
44. 0	H
45. 2	H
46. 0	S
Mean = 46.36	
Z = — 0.49	
45.87	

During these measures of distance, the stars being too bright, a green glass was interposed, which improved them greatly, especially when a little smoked; the diameters being thus reduced, and the glare taken off.

Mean result 57° 46′ *sf*; *Distance* 14″.455; *Epoch* 1822.24.

This star was observed to be double by BRADLEY, in 1755, by whose observations, according to STRUVE, its distance comes out 13″.88, and its Position 53° 5′ *sf*. Sir W. HERSCHEL saw it double on the 9th April, 1774, with a power of 211, and has given its measures in his first Catalogue as follows: *Position* 56° 46′ *sf*; *Distance* 14″.50, by two years observations, from 1779 to 1781. These measures coincide so closely with our own, that no suspicion can arise of any real considerable change in this star. The following strange observation of M. FLAUGERGUES, recorded in the Connaissance des Temps, An. xi. page 360, is therefore the more surprising. After recounting his habitual observations of it,

as a trial of his telescopes, without ever noticing its being double, he goes on to say,

"Le 4 Août, 1787, à 8 heurs du soir, regardant cette étoile avec une telescope de 15 pouces, je vis avec surprise qu'elle était composée de deux étoiles, une grande et l'autre plus petite, distante entre elles du diamétre de la plus petite. La ligne passant par ces deux étoiles était dirigée à-peu-près vers ε du Bouvier."

"Depuis cette époque j'ai observé souvent ces deux étoiles, et j'ai reconnu que la distance entre elles augmentait continuellement. Ce progrès est actuellement bien sensible et il y a au moins quinze secondes de distance entre elles, c'est à-dire trois ou quatre fois plus que lorsque je fis cette observation. La petite étoile qui est la plus au sud a de plus beaucoup augmenté de grandeur et d'éclat."

We should not have noticed this observation, which can only be regarded as an instance of the effect of familiarity, in our judgment of an object's appearance, were it not that, by a singular coincidence, the earlier observations of Sir W. H. on this very star had suggested to him a similar idea of a rapidly increasing distance.

Other measures of this star are,

Position—1800.	56° 1′ *sf*;	PIAZZI (on STRUVE's authority.)
1802.	51 14 *sf*;	HERSCHEL (Account of the Changes, &c.)
1816.	54 40 *sf*;	HERSCHEL, Junior, (7-feet reflector) MS.
1819.	55 20 *sf*;	STRUVE. Additamenta, p. 187.
1821.	55 30 *sf*;	Ditto. Astronomische Nachrichten, No. 4.
1821.78.	58 12 *sf*;	Ditto. Dorpat Obs. iii. mean of 5 measures.
Distance—1750 ... 1753.	13″.75;	BRADLEY, as computed by ZACH from his Obs.
1800.	16 .009;	ZACH, computed from PIAZZI's 1st Catalogue of stars for 1800.

ζ Ursæ Majoris continued.

1800.	15″.91;	STRUVE, computed from PIAZZI's 2d Catal.
1800-1801.	15 .4;	TRIESNECKER, by 41 measures, taken with a divided object-glass by DOLLOND.
1818-1819.	14 .24;	STRUVE, Additamenta, &c. p. 187.
1821 (Oct.)	14 .68;	Ditto, from difference of declinations = 12″.6.
1822 (Aug.)	41 .79;	Ditto, Astronomische Nachrichten, No. 22.

As these stars have, according to M. STRUVE, a common proper motion of 0″.25 per annum, it is evident either that they are connected and form a binary system, or that their apparent motion is parallactic. This proper motion is however denied by Dr. BRINKLEY, on grounds which will shortly be before the public.

No. CLXV. R. A. $13^h\ 23^m$; Decl. 11° 46′ S.

STRUVE, 441; V. 128;

Double; 6th and 8th magnitudes.

Position.	May 23, 1823. Seven-feet Equatorial. *nf*	Distance. Parts.
° ′		
11.15 S		197. 2 S
11.50 S		197. 8 S
11.37 S	Position = 11° 13′ *nf*	200. 7 S
11.17 S	Distance = 47″.720	202. 7 S
10. 5 S		200. 5 S
Mean = 11.13		Mean = 199.78
		Z = − 1.31
		198.47

1783.27; Distance 41″.96; H. Catalogue of 1785.
An apparent increase of distance amounting to 5″.760.

No. CLXVI. R. A. $13^h\ 26^m$; Decl. $27°\ 10'$ N.
H. C. 335; STRUVE, 442;
Double; equal; each $8\frac{1}{2}$ magnitude; do not bear a good illumination.

May 23, 1823.
Seven-feet Equatorial.
sp or *nf*

Position. ° ′		Distance. Parts.	
24. 5	S	44. 5	S
24. 0		44. 0	
25.30		44. 5	
25.30		42. 8	
26.30		42. 7	
25.10		43. 5	
Mean = 25.11		Mean = 43.67	
		Z = − 1.31	
		42.36	

Position = $25°\ 11'$ *sp* or *nf*
Distance = $10''.185$

June 12, 1823.
Five-feet Equatorial.
nf
9 and $9\frac{1}{2}$ magnitudes.

Position. ° ′		Distance. Parts.	
26.30	H	28. 2	H
24.40		28. 7	
23. 0		28. 0	
24.32		27. 5	
24. 0		28. 0	
		30. 0	
Mean = 24.32		Mean = 28.40	
		Z = + 0.23	
		28.63	

Position = $24°\ 32'$ *nf*
Distance = $9''.041$

Extremely difficult. H.

Mean result.

Position $24°\ 51'$ *nf*; *Distance* $9''.613$.

No. CLXVII. R. A. $13^h\ 28^m$; Decl. $6°\ 57'$ S.
81 Virginis; STRUVE, 443; I. 80;
Double; extremely close; nearly equal; the evening too unfavourable for accurate measures.

May 13, 1821.
Five-feet Equatorial.
nf or *sp*

Position. ° ′	
43.50	H
46. 0	
Mean = 44.55	

Position = $44°\ 55'$ *nf* or *sp*

81 Virginis continued.

April 9, 1823.
Five-feet Equatorial.
nf
8th and 8½ magnitudes.

Position.		Distance. Parts.	
48. 0	H	12. 0	H
45.45	H	11. 0	H
44.15	H	11. 0	H
49.15	H	12. 8	H
44.10	H	11. 5	H
48. 0	H	13. 5	S
49.55	S	12. 5	S
49. 0	S	12. 2	S
48.12	S	13. 5	S
48.45	S	12. 2	S
49.20	S		
Mean = 47.42		Mean = 12.22	
		Z = − 0.49	
		11.73	

Position = 47°.42′ *nf*
Distance = 4″.020

The night beautiful.

Mean result.

Position 47° 16′ *nf*; *Distance* 4″.020; *Epoch* 1822.94.

Other measures.

1783.10; 41 °12′ *nf* or *sp*; Interval ½ or ⅔ D; H. Cat. of 1785.

1802.31; 42 50 *np* or *sf*; H. MS. probably the quadrant wrong set down.

1821.33; 50° 18′ *nf*; Struve, Dorp. Obs. iii. 4 measures.

This star appears subject to a very slow change of position, and perhaps too to a minute increase of distance.

CLXVIII. R. A. 13^h 41^m; Decl. 27° 52′ N.

H. C. 335; Struve, 446;

Double; very nearly equal; 8½ and 8¾ magnitudes.

May 25, 1823.
Seven-feet Equatorial.
sf

Position.		Distance. Parts.	
90°—19′.40	S	26. 0	S
19.50	S	23. 3	S
18.40	S	22. 2	S
18.20	S	23. 8	S
21. 0	S	23. 0	S
19.40	S	24. 2	S
19.54	S		
Mean — 19.35		Mean = 23.75	
		Z = − 0.19	
		23.56	

Position = 70° 25′ *sf*
Distance = 5″.664.

No. CLXIX. R. A. $13^h\ 46^m$; Decl. $19^\circ\ 19'$ N.

η Bootis; STRUVE, 447; VI. 95;

Excessively unequal; the small star does not bear the least illumination.

March 25, 1821.

Five-feet Equatorial.

sf

Position = 33° 30′ *sf*

May 10, 1821.

Nine-feet Equatorial.

sf

Position.	
° ′	
31. 0	H
30. 0	S
30.10	S
30.45	S
31. 0	S
28. 0	H
28.45	H
29. 0	H
30.20	H
Mean = 29.43	

Position = 29° 43 *sf*

April 10, 1823.

Five-feet Equatorial.

sf

4 and 12 magnitudes.

Position = 26° 16′ *sf*

Distance = 2′ 6″.203

Position.	
° ° ′	
90—63.10	H
63. 0	H
64.30	S
64.15	S
Mean = 63.44	

Distance. Parts	
413. 0	H
382. 0	H
406. 0	S
Mean = 400.33	
Z = — 0.73	
399.60	

May 2, 1823.

Seven-feet Equatorial.

sf

Position.	
° ° ′	
90—59.25	S
59.45	S
58.45	S
59.20	S
Mean — 59.19	

Excessively unequal, and excessively difficult.

Position 30° 41′ *sf*

Bootis continued.

Mean result.

Position 29° 27′ *sf*; *Distance* 2 6″.203; 1822.66.

Sir W. HERSCHEL states the angle at "about 25 or 30° *sf.*" The distance given by him (about $1\frac{1}{2}$ minute) is to be regarded only as a vague estimation.

The object-glass of the telescope employed in the measures of May 10, 1821, had an aperture of 6 inches, and a focal length of 9 feet; being found however imperfect, it was laid aside almost immediately, and replaced by the present 7-feet.

No. CLXX. R. A. $13^h\ 46^m$; Decl. 33° 43′ N.

(H.C. 162;) STRUVE, 448;

Very nearly equal: 9 and $9\frac{1}{2}$ magnitudes; bear but slight illumination.

May 25, 1823.
Seven-feet Equatorial.
np

Position.		Distance. Parts.
° ° ′		
90—32.10		34. 0
31.25		33. 2
31.20 S		32. 2 S
31. 0		31. 3
30. 0		32. 6
33.15		32. 0
Mean — 31.32		Mean = 32.55
		Z = — 0.19
		32.36

Position = 58° 28 *np*
Distance = 7″.780.

No. CLXXI. R. A. $13^h\ 52^m$; Decl. 2° 26′ N.

τ Virginis; STRUVE, 450; VI. 77;

Extremely unequal; small star bears a tolerable illumination; 4th and 9th magnitudes.

April 9, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
90°—70°. 5′	H	256. 5	H
69.42	H	244. 0	H
69.45	H	252. 0	H
70. 5	H	250. 0	H
69.34	H	255. 0	H
70.10	S	253. 0	S
69.50	S	251. 5	S
70.32	S	250. 0	S
70.15	S	251. 2	S
70.30	S	252. 3	S
Mean — 70. 3		Mean = 251.55	
		Z = — 0.49	
		251.06	

Position = 19° 57′ *np*
Distance = 1′ 19″.290

1782.98; *Position np*; *Distance* 1′ 8″.36; H. Cat. of 1785.
An apparent increase of 10″.900 in distance.

No. CLXXII. R. A. $13^h\ 54^m$; Decl. 20° 17′ N.

(82 of the 145);

Double; 9 and $9\frac{1}{2}$ magnitudes.

April 22, 1823.
Seven-feet Equatorial.
sf

Position.		Distance. Parts.	
90°—17°.55′	H	93. 0	H
18. 5	H	89. 0	H
16.10	H	94. 5	H
17.50	H	92. 0	H
18.45	H	87. 4	H
19.30	S	86. 0	S
18.10	S	88. 5	S
19. 0	S	87. 5	S
18.40	S	88. 0	S
18.50	S	93. 5	S
Mean — 18.17		Mean = 89.94	
		Z = — 0.97	
		88.97	

Position = 71° 43′ *sf*
Distance = 21″.392.

Measures of distance difficult.

No. CLXXIII. R. A. $14^h\ 5^m$; Decl. 6° 14′ N.
(98 of the 145);
Double; $8\frac{1}{2}$ and 9th magnitudes.

Position.			Distance. Parts.	
° ′		May 3, 1823.		
78.15	H	Five-feet Equatorial.	19. 0	H
78.55	H	*sp*	18. 5	H
78.40	H		20. 0	H
78.25	H		17. 9	H
79.55	H		21. 5	H
79.35	S		20. 5	S
79.50	S		19. 5	S
80. 0	S	Position = 79° 20′ *sp*	19. 0	S
79.45	S		18. 8	S
80. 0	S	Distance = 6″.049.	19. 2	S
Mean = 79.20		Measures difficult.	Mean = 19.39	
			Z = − 0.24	
			19.15	

The place of this star agrees precisely with that of the 98th of the 145; but in that catalogue it is called a star of the first class, and its position is said to be directly in the meridian, the stars being $1\frac{1}{2}$ diameter asunder. Allowing 2″ for the apparent diameter of a star of the 8th magnitude in the 20-feet reflector, this distance would be 5″. It is therefore probable that this star is subject to a sensible change, both in angle and distance.

CLXXIV. R. A. $14^h\ 7^m$; Decl. 52° 39′ N.
κ Bootis; STRUVE, 454; III. 11;
A very fine double star; large, white; small, purplish or plum colour; considerably unequal.

Position.			Distance. Parts.	
° ′		March 22, 1821.		
30.59	H	Five-feet Equatorial.	45. 8	H
31.40	H	*sp*	44. 2	H
31.39	H		41. 2	H
33.28	S		45. 8	S
33.33	S		41. 5	S
30.35	S	Position = 31° 59′	44. 5	S
Mean = 31.59		Distance = 13″.817.	43.83	
			Z = − 0.08	
			43.75	

κ Bootis continued.

June 21, 1822.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.	
31.10	S	40. 3	S
31. 7		42. 1	
29.20		40. 4	
29.36		42. 8	
29.16		41. 7	
30.18		40. 0	
29.31		43. 8	
30.35		41. 5	
30.15		41. 3	
30.57		41. 1	
31.12		41. 7	
31.20			
Mean = 30.23		Mean = 41.52	
		Z = − 1.48	
		40.04	

Position = 30° 23′ *sp*

Distance = 12″.646.

April 7, 1823.

Five-feet Equatorial.

5 and 7 magnitudes.

sp

Position. ° ′		Distance. Parts.	
31.20	H	43. 0	H
31.35		39. 1	
31.35		41. 8	
32.10		39. 0	
32. 0		41. 0	
31.10	S	43. 0	S
32. 0		42. 0	
32.20		40. 7	
31.22		41. 5	
32. 0		42. 2	
Mean = 31.45		Mean = 41.33	
		Z = + 0.24	
		41.57	

Position = 31° 45′ *sp*

Distance = 13″.129.

Stars beautifully steady, and well defined.

July 6. 1823.

Seven-feet Equatorial.

by daylight.

Distance. Parts.	
56. 8	S
54. 8	
53. 0	
52. 5	
57. 0	
56. 7	
56. 3	
55. 7	
55. 2	
54. 5	
Mean = 55.25	
Z = − 0.84	
54.41	

Distance = 13″.082.

Stars very steady, measures highly satisfactory. S.

NB. This set of measures was taken to settle the discordance in the observations of distance.

κ Bootis continued.

Mean result.

Position 31° 15′ *sp* ; *Distance* 13″.136 ; 1822.62.

Other measures are as follows,

1782.30.	Position 27° 28′ *sp* ;	Distance 12″.503 (mean of 3 meas.) H. Cat. of 1782.
1802.67.	29 19 *sp* ;	Ditto. MS.
1819.62.	* 37 15 *sp* ;	STRUVE, Dorpat Obs. ii. Observationes, &c. N^{os}. 21 nd 61, pages 163, 164.
1822.67.		Distance 12″.56; Ditto. Astron. Nachr. No. 22.

No. CLXXV. R. A. $14^h\ 10^m$; Decl. 52° 12′ N.

ι Bootis ; STRUVE, 455 ; V. 9 ;

Very unequal.

March 22, 1821.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
56.58	S	121. 5	S
57.37	S	120. 2	S
57. 0	S	120. 8	S
56.25	H	121. 2	H
57. 6	H	121. 1	H
57.27	H	120. 9	H
56.33	H	122. 0	H
Mean = 57. 1		Mean = 121.10	
		Z = − 0.08	
		121.02	

Position = 57° 1′ *nf*

Distance = 38″.220

April 9, 1823.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
56.50	S	121. 0	S
56.45	S	119. 8	S
56.37	S	118. 4	H
55.32	H	120. 4	H
55. 0	H		
56.20	H		
Mean = 56.11		Mean = 120. 0	
		Z = − 0.49	
		119.51	

Position = 56° 11′ *nf*

Distance = 37″.744.

* This angle of M. STRUVE differs unaccountably from all the rest: it is a mean of two night's observations, however, in each of which two measures were taken, and whose results only differed 0°.1 or 6′ from each other. Moreover, it is corroborated by an observation of 1821.78 (Dorpat Obs. iii.) which makes it 36° 24′.

ι Bootis continued.

Mean result.

Position 56° 36′ *nf*; *Distance* 38″.047; *Epoch* 1822.24.

1782.30; 52° 21′ *nf*; 35″.40 (mean of 2 MS observations) H. 1782, Cat. and MSS.
1819.62; 56 55 *nf*; 38 .55; STRUVE, Additamenta, &c. page 188-9.
1821.80; 56 36 *nf*; 38″.283; from Δ decl. 31″.96; STRUVE, Dorp. Obs. iii.

No. CLXXVI. R. A. $14^h\ 13^m$; Decl. 6° 56′ S.

STRUVE, 456; PIAZZI XIV. 62;

Double: 8 and 8¼ magnitudes.

May 7, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.
90°—13°.11′ S		19. 0 S
15.15		17. 4
13.37		18. 8
13.58		19. 0
14.40		20. 0
14.55		18. 8
Mean — 14.16		Mean = 18.83
		Z = — 0.21
		18.62

Position = 75° 44′ *np*
Distance = 5″.880.

June 12, 1823.
Five feet Equatorial.
Nearly equal; 9th magnitude.
sf

Position.
90°—10°.15′ H
10.45
12.10
13.15
11.50
11. 0
Mean — 11.32

Position = 78° 28′ *sf*
Distance = 4″.000 ±; almost a guess; the stars too low, and the evening too hazy for any measures of distance to be gotten. H.

Mean result.

Position 77° 6′ *np*; *Distance* 5″.880; *Epoch* 1823.44.

No. CLXXVII. R. A. $14^h\ 14^m$; Decl. $9^\circ\ 16'$ N.

(H. C. 334;) Struve, 457;

Pretty unequal; large, white; small, blue decidedly; 6 and 8 magnitudes; they bear a very good illumination.

May 26, 1823.
Five-feet Equatorial.
sp

Position. ° ′		Distance. Parts.	
82.24	S	25. 2	S
85.15	S	23. 0	S
83.28	S	24. 2	S
84.25	S	24. 3	S
83.56	S	23. 8	S
84.11	S	24. 8	S
Mean = 83.56		Mean = 24.08	
		Z = − 0.11	
		23.97	

Position = $83^\circ\ 56'$ *sp*
Distance = $7''.570$

Variable refraction very troublesome; the measures however are good. S.

June 4, 1823.
Five-feet Equatorial.
$6\frac{1}{2}$ and 8 magnitudes.
sp

Position. ° ′		Distance. Parts.	
81.53	H	25. 0	H
82. 0	H	26. 9	H
81.24	H	24. 8	H
83.29	H	24. 5	H
82. 0	H	22. 3	H
81. 3	H	25. 0	H
83.30	S		
Mean = 82.11		Mean = 24.75	
		Z = − 1.63	
		23.12	

Position = $82^\circ\ 11'$ *sp*
Distance = $7''.302$

June 20, 1823.
Seven-feet Equatorial.

Position. ° ′		Distance. Parts.	
84.15	H	26. 2	H
85. 5	H	27. 8	H
84. 2	H	27. 2	H
84.15	H	27. 9	H
84.45	H	29. 0	H
Mean = 84.28		Mean = 27.62	
		Z = − 0.97	
		26.65	

Position = $84^\circ\ 28'$ *sp*
Distance = $6''.407$

(H. C. 384) continued.

Distance. Parts.		Distance. Parts.
34. 5 } S		29. 8 } H
31. 0	Position = 7″.581 S.	29. 0
32. 0	Distance = 6″.835 H.	Mean = 29.40
32. 5		Z = − 0.97
Mean = 32.50		28.43
Z = − 0.97		
31.53		

Mean result.

Position 83° 24′ *sp*; *Distance* 7″.185; *Epoch* 1823.42.

No. CLXXVIII. R. A. $14^h\ 15^m$: Decl. 12° 3′ N.

(H. C 470;) STRUVE, 458:

Double; nearly equal; 7 and 7½ magnitudes.

Position.	May 25, 1823.	Distance. Parts.
° ° ′	Five-feet Equatorial.	34. 8 } S
90—24.55 } S	*n p*	34. 2
25.36		34. 7
23.51		34. 5
24.20	Position = 65° 20′ *np*	35. 0
24.30	Distance = 10″.722.	Mean = 34.64
24.45		Z = − 0.69
Mean — 24.40		33.95

Position.	June 5, 1823.	Distance. Parts.
° ° ′	Five-feet Equatorial.	32. 8 } H
90—23.55 } H	*np*	32. 2
25.14		30. 0
25.43		31. 7
24. 0	Position = 65° 14′ *np*	33. 5
25.37	Distance = 9″.762.	32. 5
24.10		Mean = 32.12
Mean = 24.46		Z = − 1.21
		30.91

H. C. 470 continued.

Distance. Parts.	
33. 5	S
33. 7	
33. 3	
34. 3	
32. 5	
32. 4	
Mean = 33.28	
Z = — 1.32	
31.96	

July 11, 1823.
Five feet Equatorial.

Distance $= 10''.093$.

Stars 3 hours from the meridian.

Mean result.

Position 65° 17′ *np*; *Distance* 10″.192; *Epoch* 1823.34.

No. CLXXIX. R. A. $14^h\ 15^m$; Decl. 19° 8′ S.

H. C. 342; χ Turdi Solitarii, and 80 of the 145; STRUVE, 459; Double; equal.

March 17, 1821.
Five-feet Equatorial.
np

Position. ° ° ′		Distance. Parts.	
90—63.28	H	115. 8	H
64.34		117. 1	
65.15	S	114. 8	
64.15		111. 5	S
64.35		109. 0	
64.55	H	109. 0	H
		114. 0	H
		109. 0	S
Mean — 64.30			

Position $= 25° 30'$ *np*

Distance $= 35''.511$

April 11, 1823.
Five-feet Equatorial.
7 and $7\frac{1}{10}$ magnitudes.
np or *sf*

Position. ° ° ′		Distance. Parts.	
90—64.35	H	110. 4	H
63.30		116. 2	
64.40		117. 0	
63.45	S	112. 0	
63.25		113. 3	S
64.12		110. 0	
		112. 3	
		111. 5	
Mean — 64. 1		Mean = 112.84	
		Z = — 1.38	
		111.46	

Position $= 25° 59'$ *np* or *sf*

Distance $= 35''.201$

χ Turdi Solitarii, and 80 of the 145 continued.

April 19, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
90°—63° 37′	S	109. 8	S
64.15	S	110. 8	S
65. 8	S	112. 4	S
64.35	S	111. 0	S
64.15	S	111. 5	S
62.45	H	112. 0	H
63.28	H	114. 5	H
63.30	H	112. 3	H
64. 8	H	110. 4	H
65.15	H	110. 0	H
Mean — 64. 6		Mean = 111.47	
		Z = — 1.45	
		110.02	

Position = 25° 54′ *np*
Distance = 34″.746

Mean result.

Position 25° 49′ *np*; *Distance* 35″.121; 1822.60.

The distance of this star is stated in the Catalogue of 145 new double stars, at a little more than 1′. Either this must be a very rough guess, or the stars have approached enormously.

No. CLXXX. R. A. $14^h\ 22^m$; Decl. 29° 6′ N.

(H. C. 165;) STRUVE, 460;

Nearly equal; 6½ and 7 magnitudes.

May 25, 1823.
Five-feet Equatorial.
sp

Position.		Distance. Parts.	
8° 30′	S	81. 0	S
7.30	S	82. 3	S
7.50	S	83. 1	S
7.28	S	82. 4	S
7. 3	S	82. 4	S
Mean = 7.40		Mean = 82.24	
		Z = — 0.69	
		81.55	

Position = 7° 40′ *sp*
Distance = 25″.756

(H. C. 165) continued.

June 4, 1823.
Five-feet Equatorial.
8 and $8\frac{1}{2}$ magnitudes.
3 hours W. of meridian.
sp

Position.		Distance. Parts.	
° ′			
7.30	H	83. 5	H
8. 2	H	82. 8	H
7.12	H	83. 1	H
6.48	H	81. 8	H
8.15	H	85. 5	H
Mean = 7.33		Mean = 83.34	
		Z = − 1.63	
		81.71	

Position $= 7° 33'$ *sp*
Distance $= 25''.806$

Mean Result.

Position 7° 36′ *sp*; *Distance* 25″.781.

No. CLXXXI. R. A. $14^h 32^m$; Decl. 17° 12′ N.

π Bootis; STRUVE, 461; III. 8;

Nearly equal; large, white; the small perhaps inclines to blue.

March 22, 1821.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
° ′			
7.19		22. 8	H
7.21		21. 7	H
6.52		23. 0	H
		20. 0	S
		23. 5	S
		21. 8	S
Mean = 7.11 *		Mean = 22.13	
		Z = − 0.08	
		22.05	

Position $= 7° 11'$ *sf*
Distance $= 6''.965$.

June 21, 1822.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
° ° ′			
90—81.12	S	22. 5	S
81.30	S	22. 8	S
81.15	S	23. 4	S
82.44	S	22. 9	S
81.36	S	23. 7	S
81.25	S	22. 8	S
82.20	S	22. 9	S
82.40	S	24. 0	S
82.12	S	22. 5	S
82. 2	S	24. 0	S
Mean — 81.54		Mean = 23.15	
		Z = − 1.48	

Position $= 8° 6'$ *sf*
Distance $= 6''.843$.

π Bootis continued.

Mean result.

Position 7° 53′ *sf*; *Distance* 6″.889; *Epoch* 1822.05.

Other measures are,

1781.83; 6° 28′ *sf*; 6″.171; H. Catalogue of 1782.
1803.19; 7 37 *sf*; Ditto. MSS.
1819.61; 9 50 *sf*; STRUVE, Dorpat Obs. ii.; p. 163, 165; N^os. 2, 15, 67.
1823.19; 6″.12; AMICI; ZACH'S Corresp. Astronom. viii. p. 216.

No. CLXXXII. R. A. 14^h 33^m; Decl. 14° 31′ N.

ζ Bootis; STRUVE, 462; VI. 104;

Nearly equal; each of the 6th magnitude; extremely close, but distinctly separated with a power of 240.

April 10, 1823.
Five-feet Equatorial.
np or *sf*

Position. ° ° ′		Distance. Parts.	
90—54.18	H	6. 0	H
56.30	H	5. 0	H
48. 0	H	6. 0	H
51. 0	H	4. 9	H
54. 0	H	5. 8	H
53.17	S	6. 5	S
53.12	S	6. 3	S
51.15	S	7. 1	S
53.45	S	6. 0	S
55. 0	S	7. 0	S
Mean — 53. 2		Mean = 6.06	
		Z = — 0.73	
		5.33	

Position = 36° 58′ *sf*
Distance = 1″.683

This star is described in Sir W. HERSCHEL'S Catalogue of 1785 as of the 6th class, on account of a small star near, but was afterwards observed by him, as also by Messrs. BESSEL, STRUVE, POND, and SOUTH, to be double of the first class. M. AMICI has also noticed the close star, and measured its distance, which he states at 1″ (ZACH, Corresp. Astron. viii. page 222) but this is probably too small.

No. CLXXXIII. R. A. $14^h\ 36^m$; Decl. 8° 27′ N.

STRUVE, 463; II. 82;

Nearly equal; 8 and 9 magnitudes; bear but a feeble illumination.

May 28, 1823.

Seven-feet Equatorial.

sf

Position.		Distance. Parts.	
° ° ′			
90—83.50	S	33. 3	S
84.52		35. 5	
85.15		33. 0	
85.10		32. 0	
82.45		32. 0	
85.25		31. 5	
Mean — 84.33		Mean = 32.88	
		Z = — 0.37	
		32.51	

Position = 5° 27′ *sf*
Distance = 7″.816

Very difficult to measure, both in position and distance.

June 18, 1823.

Seven-feet Equatorial.

sf

8 and 9 magnitudes.

Position.		Distance. Parts.	
° ° ′			
90—85.10	H	29. 0	H
87.30		27. 0	
86.35		33. 0	
86. 5		31. 5	
88. 0		28. 0	
		31. 0	
		33. 5	
Mean — 86.44		Mean = 30.43	
		Z = — 0.97	
		29.46	

Position = 3° 16′ *sf*
Distance = 7″.083

July 6, 1823.

Five-feet Equatorial.

Position.	
° ′	
23. 5	S
24. 3	
25. 7	
25. 1	
25. 4	
25. 0	
Mean = 24.83	
Z = — 0.90	
23.93	

Distance = 7″.557

Measures taken, the stars being nearly 3 hours west of the meridian, but tolerably steady; the measures however are difficult. S.

II. 82 continued.

July 11, 1823.

Five-feet Equatorial.

Distance. Parts.	
23. 3	S
22. 6	
23. 8	
22. 7	
24. 0	
22. 3	
Mean = 23.12	
Z = − 1.32	
21.80	

Distance = 6″.885.

Stars 2 hours west of meridian. S.

Mean result.

Position 4° 27′ *sf*; *Distance* 7″.335; 1823.44.

In 1783 the Position was 1° *sf*; H. Catalogue of 1785.

No. CLXXXIV. R. A. $14^h\ 36^m$; Decl. 24° 40′ S.

30 BODE Turdi Solitarii id. 73 Hydræ FL.; III. 97;

Double; very unequal. Large, red; small, blue. The small star does not bear illumination well.

June 19, 1822.

Five-feet Equatorial.

sf

Position. ° ° ′	
90—43.21	S
43. 4	
42.52	
42.45	
43. 5	
Mean — 43. 1	

Position = 46° 59′ *sf*

Distance = 9″.904

Distance. Parts.	
32. 5	S
33. 3	
33. 9	
32. 4	
32. 1	
Mean = 32.84	
Z = − 1.48	
31.36	

These angles were taken by twilight, without artificial illumination of the wires; but the distances by the aid of a lamp.

30 Bode Turdi Solitarii continued.

Position.	April 11, 1823.	Distance. Parts.
° ° '	Five-feet Equatorial.	
90—44.57	6 and 8 magnitudes.	34. 0
41.40	*sf*	34. 7
45.33		34. 0
43. 0		31. 5
43. 2	Position = 46° 22′ *sf*	30. 0
		34. 2
Mean — 43.38	Distance = 10″.007	
		Mean = 33.07
		Z = — 1.38
		31.69

Mean result.

Position 46° 40′ *sf*; *Distance* 9″.955; 1822.87.

The star III. 97 is called in Sir W. Herschel's Catalogue for 1785, 54 Hydræ, which Bode has altered in his Catalogue to 73 Hydræ, or 30 Turdi Solitarii On referring to the copy of Flamsteed's Atlas, used by him in his Observations, Reviews, &c. (in which the numbers are affixed to the stars in MS. in red ink) the number 54 is found annexed to a star corresponding in place (allowance for precession being made) with Bode's 30 Solitarii Turdi. Without deciding therefore which number is correct, the identity of the star here measured with 30 Turdi Sol. is fully established. His measures are,

1783.03; 38° 15′ *sf*; 11″.29; H. Catal. of 1785.

The angle therefore has undergone a change of 8° 25′, and the distance a diminution of 1″.335.

No. CLXXXV. R. A. $14^h\ 37^m$; Decl. 27° 51′ N.
ε Bootis; STRUVE, 464; I. 1.
Large, yellow; small, blue-green; a very marked contrast of colours.

March 25, 1821.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
° ° ′ 90—34.40	H	13. 0	H
38.30	H	10. 0	H
34.30	H	17. 0	H
34.35	H	16. 5	S
37.30	H	14. 3	S
37.10	H		
40.39	S	Mean = 14.16	
40. 5	S	Z = − 0.08	
42.10	S	14.08	
39.15	S		
Mean — 37.54			

Position = 52° 6′ *n p*
Distance = 4″.447

April 27, 1821.
Five-feet Equatorial.
n p

Position.		Distance. Parts.	
° ° ′ 90—39. 6	H	13. 8	H
37. 0	H	11. 0	H
37. 2	H	13. 1	H
38. 8	H	13. 3	H
36.35	H	10. 1	H
37.34	S	12. 8	H
38.19	S	10. 5	H
37.10	S	11. 5	S
37.15	S	11. 0	S
37.39	S	12. 8	S
37.51	S	13. 5	S
37.46	S	14. 0	S
Mean — 37.37		Mean = 12.28	
		Z = − 0.11	
		12.17	

Position = 52° 23′ *np*
Distance = 3″.844.

April 9, 1823.
Five-feet Equatorial.
n p

Position.		Distance. Parts.	
° ° ′ 90—42.45	H	9. 7	H
43.15	H	11. 0	H
43.30	S	10. 0	S
42.55	S	11. 0	S
Mean — 43. 6		Mean = 10.42	
		Z = − 0.49	
		9. 93	

Position = 46° 54′ *n p*
Distance = 3″.135.

Measures taken by very strong twilight, or full daylight.

The micrometer being purposely set to 90°—37° 30′, the small star stood visibly above the line of direction of the moveable wire.

ε Bootis continued.

Seven-feet Equatorial.

3rd and 8th magnitudes.

np

Position.		Distance. Parts.	
90°—46° 15′	H	17. 2	H
41.20		18. 5	
45. 0		20. 0	
43.30		18. 6	
43.10		19 0	
Mean — 43.51		Mean = 18.66	
		Z = — 0.97	
		17.69	

Position = 46° 9′ *n p*

Distance = 4″.253

June 16, 1823.

Five-feet Equatorial.

By daylight. Position.		By daylight. Position.	
90°—31° 15′	S	90°—32° 45′	S
34.42		34.13	
35.23		33.07	
35.12		32.35	
34. 4		31.56	
		30. 5	
Mean — 34. 7 without coloured glass.		Mean — 32.28	

Position = 55° 53′ Without,

Position = 57 32 With, green glass.

A piece of green glass interposed between the eye and the eye-glass.

Seven-feet Equatorial.

June 16, 1823.

By twilight. Position.		By lamplight. Position.	
90°—32° 0′	S	90°—41° 0′	H
33.27		40.40	
32.30		38.30	
33.45		34.30	
33.50		37.32	
34.43		38. 7	
35. 0		39. 0	
33.35		Mean — 38.28	
33.10			
32.37			
34.32			
34.31			
35. 0			
Mean — 33.45			

Position = 56 16 S

Position = 51° 32′ H.

Mean result.

Position 52° 59′ *np* ; *Distance* 3″.931 ; 1822.55.

Nothing can be more unsatisfactory than the measures of this very difficult star, especially in position, the difference

ϵ Bootis continued.

between the greatest and least among the single measures amounting to the enormous quantity of 16° 10′, and even among the mean results of whole sets of observations extending to 10 or 11°. The closeness, and great difference of size and colour of the two stars, will partly account for this; but if we compare our measures of this with those of Rigel, in which the difference of size is much more considerable, and where the two stars are also very close (the distance being within 9″) we shall find reason to believe that some other cause than mere imperfection of vision, bias of eye, or error in judgment, must have operated. There can be no doubt but that, had the micrometer been purposely deranged 16° after any measure with which the observer had been tolerably satisfied, he could not possibly have avoided noticing the change on reviewing his measure. The remark annexed to the observations of April 9, with the five-feet instrument, shows that a much less change proved intolerably offensive to the eye. Refraction, acting differently on two stars close together, and differing so decidedly in colour as these do, might be expected to produce great alterations in their relative apparent situations, but unluckily this will not account for the *particular* changes observed. The point requires farther investigation. Meanwhile, the mean angle above given being concluded from 62 single measures, is probably near the truth.

ε Bootis continued.

The measures arranged in order are,

Position.

1781.73; 35° 7′ *np*; H. mean of 6 measures, from Aug. 31, 1780, to Feb. 26, 1783 (MSS.)

1796.63; 45 32 *np*; Ditto, single measure "Account of Changes, &c."

1803.01; 44 39 *np*; Ditto, mean of 8 measures, from Jan. 28, 1802, to March 26, 1803, "Account of Changes, &c. Phil. Trans. 1803" and MSS.

1819.60; 54 6 *np*; Struve, Additamenta, a mean of two measures, and seven estimations.

1822.55; 52 59 *np*; H. and S. ut supra, mean of 62 measures.

Distance.

1780.31; 4″.062; H. single measure, MS. "too full, no doubt."

1816.04; 2 .350; Amici, mean of 3 measures in 1815 and 1817. Vide Zach Corr. Astron. Vol. 8, page 73.

1819.6; 4 .963; computed from a set of observations of differences of R. A. by Struve (Additam. 189), where he makes the difference of R. A. = $0^s.232$ in time.

1822.55; 3 .931; H. and S. ut supra, mean of 26 measures.

The angular motion is indisputable. Taking the mean dates 1781.73 and 1822.55 as epochs, the angle described in the interim was 17°.86, and the time $40^y.8$, giving a mean annual motion of 0°.4378 in the direction *nf sp*, or direct. Supposing it uniform, the position at the epoch 1803.01 should have been 44° 26′, instead of 44° 39′, which the observations give. The difference is too trifling for notice.

No. CLXXXVI. R. A. 14h 41′; Decl. 15° 15′ S.

(α Libræ ;) not in STRUVE'S Catalogue ;

4th and 6th magnitudes.

June 23, 1823.

Five-feet Equatorial.

n p

Position. ° ° ′		Distance Parts.	
90—45.25	S. By twilight.	729. 0	S. By twilight.
45.45		732. 6	
45.27		735. 2	
45.20		732. 3	
45.23		733. 3	By lamplight.
45. 2		733. 0	
45.33		729. 0	
45.30		733. 3	
45.40		731. 2	
45.25		731. 4	
Mean — 45.27		Mean = 732.03	
		Z = — 1.07	
		730.96	

Position = 44° 33′ *np*

Distance = 3′ 50″.853

Stars very steady.

No. CLXXXVII. R. A. 14h 43m; Decl. 19° 51′ N.

ξ Bootis ; STRUVE, 466 ; II. 18 ;

March 15, 1821.

Five-feet Equatorial.

n p

Double ; very unequal.

Position. ° ° ′		Distance. Parts.	
90—17.18	H	31. 0	H
—17.45		32. 9	
—17.42		31. 5	
—17.31	S	33. 6	S
—17.30		33. 2	
—18. 0		32. 5	
Mean — 17.38 *		Mean = 32.45	
		Z = — 3.16	
		29.29 *	

Position = 72° 22′ *np*

Distance = 9″.250.

ξ Bootis continued.

May 4, 1823.

Five-feet Equatorial.

$5\frac{1}{2}$ and 8 magnitudes.

np

Position. ° ′		Distance. Parts.	
90—20.24	H	26. 6	H
20. 0	H	27. 1	H
18.36	H	28. 8	H
20.20	H	26. 0	H
18.50	H	24. 5	H
18.30	H	25. 8	H
20.12	S	28. 0	S
20. 5	S	26. 9	S
20.16	S	25. 2	S
20.10	S	25. 0	S
20.30	S	27. 8	S
20. 2	S	28. 3	S
Mean — 19.50		Mean = 26.67	
		Z = — 0.01	
		26.66	

Position = 70° 10′ *np*

Distance = 8″.419

Stars beautifully defined, and measures highly satisfactory.

Mean result.

Position 70° 54′ *np* ; *Distance* 8″.696 ; 1822.63.

The ensemble of observations of this star, by different observers, is as follows.

Position.

1782.28 ;	65° 53′ *nf* ;	very exact.	H. Catalogue of 1782.
1791.39 ;	. . . *nf* ;	Ditto.	MS. 20-feet sweep.
1792.30 ;	85 43 *np* ;	Ditto.	" Account of Changes, &c."
1795,22 ;	84 56 *np* ;	Ditto.	Ditto.
1802.25 ;	82 57 *np* ;	Ditto.	Ditto.
1804.25 ;	83 54 *np* ;	Ditto.	Ditto.
1819.4 ;	75 0 *np* ;	STRUVE, Additamenta, &c. p. 189.	
1821.20 ;	72 32 *np*	H. and S. ut supra.	
1823.37 ;	70 10 *np*	H. and S. ut supra.	

ξ Bootis continued.

Distance.

1780.67 ; 4″ ± ; H. 1½ diameter, with 222 (estimation.)

1780.69 ; 3.38 ; H. Catalogue of 1782, single measure.

1804.25 ; 6 + ; " Too far to estimate by diameters. The small star is now farther " off than formerly. It is farther off than in π Bootis, which " is in the 3rd class, though ξ is in the second." H. " Account " of Changes," &c. ;" π is 6″.

1822.63 ; 8. 696 ; H. and S. ut supra, mean of 18 measures.

1823.30 ; 6 .667 ; AMICI. Letter to Baron de ZACH, Corr. Ast. viii. p. 216.

If we lay down the distances and angles here given on a scale (with the exception of M. AMICI'S, which is evidently much too small ; indeed all his measures hitherto published, appear to err more or less on that side), the apparent relative orbit of the small star *ss′s″*, will be found not to deviate much from a strait line, the slight degree of concavity towards the large one observable in it (See fig. 1, Plate IV.) being not to be depended on, on account of the uncertainty of the estimation on which the distance of 6″ depends. Moreover the motion in it will be found to be not far remote from uniformity. The position *ss′* and *s′ s″* being in the ratio of 18 to 24, and the times in that of 18 : 22. The obvious conclusion therefore is, that the two stars are unconnected, and the relative motion merely the difference of their proper motions ; If so, both stars must have a considerable proper motion, for the large one (according to PIAZZI) has one which alone would carry it in the *sp* direction, at an angle of about 40° from the parallel (and therefore almost directly away from the small star, at the rate of about 0″.30 per annum.) This would explain the increase of distance, but not the angular motion. To explain both it becomes necessary

ξ Bootis continued.

to attribute to the small star a motion of —0″.35 in R.A., and —0″.07 in declination, those of the large one being —0″.23, and —0″.18. This, though very possible, is not very probable, unless we admit a connection of some kind between the stars, and other circumstances conspire to throw a doubt on the validity of the opposite conclusion. The first is, that either the position of 1804, or that of 1792, is certainly incorrect. The observation of 1791, when taken in combination with that of the following year, shows that about that time the angle of position must have been exactly a right one, the small star then being in the act of changing quadrants. Even with this concession, supposing the position to have been exactly north in 1791-2, and assuming this (1791.8) as an epoch, the angle described in the 10 preceding years will have been 24°, while in the 11 succeeding ones it amounted to no more than 7°½ (up to 1803.25, the mean between the observations of 1802 and 1804) or 0°.68 per annum. Yet this rapid diminution of angular velocity has not continued, for in the next 20 years, up to 1823, we find an angular motion of 13°, or 0.65 per annum, and taking only the observations of the last four years, it exceeds a degree per annum. These considerations indicate a considerable error, either in the measures of 1802, 1804, which corroborate each other, or in that of 1782, which is marked "very exact." Here then we have a choice of difficulties, but fortunately a few years will enable us to decide. If the relative path of the small star be really the strait line it appears to be, the angle of position will never reach 50° *np*, and the angular velocity will diminish continually from the present moment. On the other hand,

ξ Bootis continued.

if the stars form a binary system, the present angular velocity of about a degree per annum, will continue for some time nearly uniform, and in 15 or 20 years the limit of 50° *np* will be attained or passed.

If we give up the observations of 1802, 1804, and suppose the position to have been exactly north at the epoch 1792.8, the observations, both of angle and distance, will be nearly represented by a circular orbit, described with a mean motion of 1°.8 per annum, and inclined at an angle of 13° 34′ to the visual ray, supposing the intersection with the plane of projection to lie in the *np* and *sf* quadrants, at an angle of 70° with the parallel; but the data are too precarious to rely much on this conclusion.

There is a small star at about $1\frac{1}{2}$ or 2 minutes distance, and at about 82° *np*, which is not to be suspected with the seven-feet reflector (aperture 6 inches) and can barely be discerned by rare glimpses (knowing its place) in the ten (aperture 9 inches) but with the twenty-feet it is very conspicuous. This was observed by Sir W. HERSCHEL, in 1792, to be in the same line with the two stars of ξ, or rather, according to a diagram made at the time of observation, a little more (3° by measurement of the diagram) to the *preceding* side of that line. It became interesting to re-observe this star, as a verification of the motion of ξ. Accordingly, in the month of July last, the twenty-feet reflector (aperture 18 inches) being directed on it, ξ and the neighbouring small stars were seen as in fig. 2, Plate IV. The small star in question is 6, and is now decidedly on the *following* side of the line of junction of the two stars of ξ, and that by a

ξ Bootis continued.

quantity nearly what it ought to be, on the supposition of the reality of the motions above attributed to the two stars.

In the diagram above alluded to, fig. 2; 1 and 2 are the two stars of ξ; 3, 4, 5, 6, are pretty conspicuous stars, nearly of equal magnitudes, (*i.e.* of the 15th or 16th) and 7 is an excessively minute star, perhaps hardly exceeding the 20th magnitude, being almost the *minimum visibile* with this aperture.

No. CLXXXVIII. R. A. $14^h\ 44^m$; Decl. $49^\circ\ 27'$ N.

39 Bootis; STRUVE, 467; II. 79;

Double; nearly equal.

April 28, 1821.
Five-feet Equatorial.
nf

Position. ° ′		Distance. Parts.	
47.12	H	9. 8	H
47.30		11. 0	
48.17		10. 9	
47.27		11. 3	
47.10		11. 0	
47. 0 15	H	10. 8	S
47. 0		10. 5	
46.45		11. 5	
46.40		10. 0	
47. 0		10. 1	
Mean = 47.14		Mean = 10.69	
		Z = − 0.11	
		10.58	

Position = $47^\circ\ 14'$ *nf*
Distance = $3''.341$.

September 13, 1823.
Five-feet Equatorial.

Position. ° ′	
14.1	S
14.8	
16.0	
Mean = 14.97	
Z = − 0.48	
14.49	

Distance = $4''573$.

Stars too low and too faint for accuracy, but are remarkably steady.

39 Bootis continued.

September 15, 1823.
Five-feet Equatorial.
6 and $6\frac{1}{4}$ magnitudes.
nf

Position.	Distance. Parts.
° ′	
41.45	14. 0
42.40	14. 5
41.58 S	16. 5
41.30	15. 7
41. 8	14. 7
41.55	14. 4 S
	14. 8
	16. 4
	15. 6
	16. 0
	16. 2
	15. 6
Mean = 41.49	Mean = 15.37
	Z = − 0.68
	14.69

Position $= 41^\circ.49'$ *nf*
Distance $= 4''.639$.

September 29, 1823.
Five-feet Equatorial.
nf

Position.	
° ′	
40. 32	
42. 30	
43. 0	Mr. RICHARDSON.
44. 0	
45. 10	
45. 20	
Mean = 43.25	

Position $= 43^\circ.25'$ *nf*

Stars at times tremulous, at other times steady; but observations not very satisfactory. Measures of distance impracticable.

Mean result.

Position $44^\circ\ 55'$ *sf; Distance* $4''.626$. *Epoch* 1822.93.

In taking the mean the distances of 1821 are registered. The observations of this star are very unsatisfactory both in angle and distance. It was thought better however to give them with this mark of reprobation than to suppress them altogether, as this is one of the stars in which there can hardly be a doubt of a slow change in the angle of position. Other observations give as follows:

1783.02, Position,	$38^\circ.21'$ *nf*;	Interval $1\frac{1}{2}$ D;		H. Catalogue of 1785.
1802.67,	41.48 *nf*;			D°. MS.
1219.74,	49.33 *nf*;	Distance	$5''.00$;	STRUVE, Additam. ii. 189.
1821.78,	48. 1 *nf*;		4.600;	D°. Dorp. Obs. iii. from Δ decl. $= 3''.42$

No. CLXXXIX. R. A. $14^h\ 55^m$; Decl. 48° 2′ N.

346 Bode Bootis; Struve 471; V. 122;

Extremely unequal; 8th and 12th magnitudes.

May 28, 1823.

Five-feet Equatorial.

sf

Position.	
° ′	
157.0	S
151.0	S
151.8	S
152.8	S
149.0	S
151.0	S
Mean — 152.10	
Z = — 0.37	
151.73	

Distance = 36″.482. S

June 16, 1823.

Seven-feet Equatorial.

$6\frac{1}{2}$ and 10th magnitudes.

sf

Position.	
° ° ′	
90—19.20	H
20. 5	H
19. 2	H
22.20	H
20. 5	H
20.10	H
21. 0	H
22. 1	S
22.24	S
23. 0	S
22.10	S
21.45	S
Mean = 21.7	

Position = 68° 53′ *sf*

Distance = 36″.525.

June 16, 1823.

Distance. Parts.	
149. 0	S
147. 0	S
152. 0	S
154. 0	S
153. 5	S
156. 0	S
Mean = 151.92	
Z = — 0.01	
151.91	

Mean result.

Position 68° 53′ *sf*. *Distance* 36″.544; 1823.43.

Sir W. Herschell's measures are 67° 6′ *sf*; 34.″35; 1783.65.

No. CXC. R. A. $14^h\ 48^m$; Decl. $20^\circ.35'$ S.
(28 of the 145);
Large white, small blue; 7th and 8th magnitudes; nearly in the parallel.

April 27, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
$+0^\circ.58'$ *sp*	S	31. 8	S
−0.15 *np*		35. 0	
−0.54 *np*		33. 3	
−0.35 *np*		34. 3	
+0.20 *sp*		36. 1	
−0.31 *np*		34. 3	
0. 9 *np*		Mean = 34.13	
		Z = + 0.14	
		34.27	

Position = $0^\circ\ 9'$ *np*
Distance = $10''.823$.

No. CXCI. R. A. $14^h\ 55^m$; Decl. $54^\circ\ 33'$ N.
(63 of the 145); STRUVE, 470; H. C. 354;
Double; 7th and $7\frac{1}{2}$ magnitudes.

April 27, 1823.
Five-feet Equatorial.
np

Position.		Distance Parts.	
$90^\circ - 16^\circ.45'$	S	131. 3	H
16.47		130. 4	
17. 7		128. 4	
17.26		125. 0	
18 10		130. 8	
18. 5		130. 5	
		131. 3	
Mean — 17.23		Mean = 129.67	
		Z = + 0.14	
		129.81	

Position = $72^\circ.37'$ *np*
Distance = $40''.997$.

May 3, 1823.
Five-feet Equatorial.
7th & $7\frac{1}{2}$ magnitudes. H.
np

Position.		Distance. Parts.	
$90^\circ - 15^\circ.30'$	H	129. 8	H
16.25		129. 2	
15.25		127. 0	
16.50		128. 5	
16.18		130. 0	
16.40			
16.35	S		
17.52			
Mean — 16.26		Mean = 128.90	
		Z = − 0.24	
		128.66	

Position = $73^\circ\ 34'$ *np*
Distance = $40''.633$.

Mean result.

Position $73^\circ\ 10'$ *np*; *Distance* $48'',845$; 1823.33.

No. CXCII. R. A. $14^h\ 56^m$; Decl. $6^\circ\ 12'$ N.

(37 of the 145);

Double; nearly equal; 8th and $8\frac{1}{4}$ magnitudes.

May 1, 1823.

Five-feet Equatorial.

np

Position.		Distance. Parts.	
$^\circ$ $\ ^\circ$ $'$			
90—13.25	S	34. 8	S
12.27		33. 7	
14.20		33. 5	
13.35		32. 7	
13.35		34. 5	
14.25		33. 3	
Mean — 13.41		33.75	
		Z = + 0. 14	
		33.89	

Position $= 76^\circ.19'$ *np*

Distance $= 10''.703$.

May 3, 1823.

Five-feet Equatorial.

np

Position.		Distance. Parts.	
$^\circ$ $\ ^\circ$ $'$			
90—13. 2	H	35. 7	S
13.20		35. 6	
12.40		34 2	
12.30		33. 1	
14.58		33. 5	
Mean — 13.18		Mean = 34. 42	
		Z = — 0. 24	
		34. 18	

Position $= 76^\circ.42'$ *np*

Distance $= 10''.795$.

Mean result.

Position $76^\circ\ 30'$ *np*; *Distance* $10''.749$; 1823.33.

No. CXCIII. R. A. $14^h\ 58^m$; Decl. 48° 21′ N.

44 Bootis; STRUVE, 472; I. 15.

Pretty unequal.

April 18, 1821.

Position.

° ′	
39.55	H
41.39	H
39.20	H
41. 0	H
41.45	S
40. 0	S
41.30	S
40.14	S

Mean = 40.40

Five-feet Equatorial.
sp

Position = 40°.40′ *sp*
Distance = 2″.277.

April 27, 1821.

Distance.
Parts.

7. 0	H
6. 2	H
6. 8	H
6. 0	H
8. 0	H
7. 0	H
7. 1	S
8. 0	S
6. 7	S
8. 5	S
8. 0	S
8 6	S

Mean = 7.32
Z = 0.11

7.21

May 14, 1821.

Five-feet Equatorial.
sp

Position.

° ′	
40.40	S
41. 5	S
41.12	S
41.50	H
40.59	H
41.15	H

Mean = 41.10

Position = 41° 10′ *sp*

Mean result.

Position 40° 53′ *sp*. *Distance* 2″.277; 1821.33.

The identity of this star with I. 15, may be questioned, as it is not impossible that there may be another double star of the first class near the same place, with which it has occasionally been confounded. If not, or unless one or both of

the stars be variable in magnitude, it is not easy to reconcile the observations, which are as follows ;—

1781.62. Position 29° 54′ *nf.* H. Catalogue of 1782. " Considerably unequal."
1787.36. MS.—20 feet sweep.—" 1st. class. Equal."
1802.25. 27 1 *sp* MS.
1803.19. The position is not *sp*, as marked in the last observation, but *nf.*—7 feet. Power 460. Distance barely ½ diam. of S.
1819.43. Position 42° *sp.* STRUVE, Additamenta, &c. p. 178.
1821.33. 40° 53′ *sp.* H. and S. ut supra. The two last observations go to destroy M. STRUVE's idea of several revolutions having been performed in 38 years.

No. CXCIV. R. A. $14^h\ 59^m$; Decl. 9° 55′ N.

H. C. 472 ; STRUVE, 474 ;

Double ; nearly equal ; 8th and 8¼ magnitudes.

May 26, 1823.
Five-feet Equatorial.
sp

Position.	
° ′	
64. 4	S
63.30	S
61.10	S
63.15	S
64.50	S
63. 0	S
Mean = 63.18	

Position = 63′.18″ *sp*

Variable refraction excessively troublesome, but the measures taken with the greatest care.

June 4, 1823.
Five-feet Equatorial.
7th and 7¼ magnitudes,
sp

Position.		Position.		Distance. Parts.	
° ′		° ′			
61. 0	S	60.50	H	16. 2	H
61. 0	S	59.30	H	16. 8	H
61.25	S	60. 5	H	15. 5	H
60. 0	S	61.10	H	17. 2	H
60. 0	S	60.29	H	17. 6	H
60. 5	S	59.30	H	16. 0	H
Mean = 60.35		Mean = 60.16		Mean = 16.55	
				Z = − 1.63	
				14.92	

Position = 60°.35′ *sp* S.
Position = 60°.16′ *sp* H.
Distance = 4″.712.

H. C. 472, STRUVE 474, continued.

June 12, 1823.
Five-feet Equatorial.
sp

Position.		Distance. Parts.	
° ′			
58. 0	H	14. 5	H
57.10	H	14. 9	H
57.30	H	15. 7	H
		15. 2	H
Mean = 57.33		Mean = 15.07	
		Z = + 0.23	
		15.30	

Position = 57° 33′ *sp*
Distance = 4″.832.

July 11, 1821.
Seven-feet Equatorial.
sp

Distance. Parts.	
21. 2	S
20. 9	S
22. 7	S
21. 2	S
20. 8	S
20. 2	S
Mean = 21.17	
Z = − 1.18	
19.99	

Distance = 4″.806

Mean result.

Position 60° 50′ *sp*; *Distance* 4″.777; *Epoch* 1823.42.

CXCV. R. A. $15^h\ 4^m$; Decl. 17° 45′ S.

97 BODE Libræ; STRUVE, 416; V. 131.

Large, white; small, bluish; 7th and 9th magnitudes.

April 11, 1823.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
° ° ′			
90—39.10	S	156. 0	S
40.12	S	152. 0	S
39. 0	S	155. 5	S
38.30	S	156. 5	S
37.40	S	154. 5	S
39.30	S	161. 0	H
38. 0	H	154. 0	H
40. 2	H	155. 0	H
39.12	H	163. 0	H
40.10	H	159. 0	H
38. 0	H		
Mean — 39. 2		Mean = 156.65	
		Z = − 1.38	
		155.27	

Position = 50°.58′ *sf*
Distance = 49″.037.

1783.26; *Distance* 47″.77. H. Catal. of 1785.

CXCVI. R. A. $15^h\ 5^m$; Decl. 28° 36′ N.

V. 125.

Double; nearly equal; 8th and $8\frac{1}{2}$ magnitudes.

June 5, 1823.

Seven-feet Equatorial.

sp

Position.	Distance Parts.
° ′	
42.50	135. 2
42.30	136. 2
43.47 S	137. 0 S
43.45	137. 7
43.32	136. 7
Mean = 43.17	Mean = 136.56
	Z = − 1.17
	135.39

Position = 43° 17′ *sp*

Distance = 32.″553.

1783.64; Position 37.°33′ *sp*; 1783.26. Distance = 33″.88; H. Cat. of 1785.

No. CXCVII. R. A. $15^h\ 5^m$; Decl. 19° 56′ N.

(62 of the 145);

Double; 7th and 8th magnitudes.

May 1, 1823.

Five-feet Equatorial.

nf

Position.	Distance. Parts.
° ′	
81.13	79. 8
81. 5	80. 5
81.30 S	81. 3 S
81.54	83. 2
82.12	80. 0
81.31	82. 7
Mean = 81.34	Mean = 81.25
	Z = + 0.14
	81.39

Position = 81° 34′ *nf*

Distance = 25″.705.

May 3, 1823.

Five-feet Equatorial.

nf

Position.	Distance. Parts.
° ′	
79.30	85. 4
80.34	81. 0
79.35 H	82. 0 H
81.10	82. 2
80.12	81. 9
Mean = 80.12	82.50
	Z = − 0.24
	82.26

Position = 80° 12′ *nf*

Distance = 25″.979.

Mean result.

Position 80° 51′ *nf*; *Distance* 25″.842; 1823.33.

No. CXCVIII. R. A. $15^h\ 5^m$; Decl. $39°\ 22'$ N.

H. C. 289; STRUVE, 477;

Double; nearly equal; $8\frac{1}{2}$ and $8\frac{3}{4}$ magnitudes.

May 28, 1823.
Seven-feet equatorial.
np

Position.	
90°—76°.12	H
77.15	
76.50	
76.20	
75.50	
Mean — 76.29	

Position = 13° 31′ *np* H.
Position = 13° 9′ *np* S.
Distance = 31″.319

May 29, 1823.

Position.		Distance. Parts.	
90°—77°. 0	S	130. 3	S
76.43		130. 5	
Mean — 76.51		130. 8	
		129. 5	
		129. 2	
		Mean = 130.06	
		Z = + 0.20	
		130.26	

June 16, 1823.
Seven-feet Equatorial.
np

Position.		Distance. Parts.	
90°—75°.45	H	132. 0	H
76.57		129. 5	
76.20		128. 0	
76.45		129. 5	
77. 5		129. 0	
75.45		Mean = 129.60	
Mean — 76.26		Z = — 0.01	
		129.59	

Position = 13° 34′ *np*
Distance = 31″.159

Mean.

Position 13° 29′ *np*; *Distance* 31″.239; 1823.43.

No. CXCIX. R. A. $15^h\ 8^m$; Decl. $34°\ 0'$ N.

δ Bootis; STRUVE, 479; VI. 16;

Large, white; small, blue decidedly.

May 22, 1821.
Five-feet Equatorial.
May 22, 1821.
nf

Position.		Distance. Parts.	
10°.30	H	339. 0	H
10.42		331. 7	
10.33		329. 0	
Mean = 10.35		Mean = 333.23	
		Z = — 0.05	
		333.18	

Position = 10° 35′ *nf*
Distance 1′ 45″.226

δ Bootis continued.

April 7, 1823.
nf
Five-feet Equatorial.
4th and 8th magnitudes.

Position.		Distance. Parts.	
11. 0	S	335. 0	S
10.30	S	333. 3	S
10.20	S	334. 2	S
10.10	S	333. 5	S
11. 0	S	332. 8	S
10.10	H	335. 5	H
10.30	H	336. 2	H
11. 5	H	335. 0	H
10.25	H	331. 0	H
9.40	H	328. 0	H
Mean = 10.29		Mean = 333.45	
		Z = + 0.24	
		333.69	

Position = 10° 29′ *nf*
Distance = 1′ 45″.386

Mean

Position 10° 31′ *nf*; *Distance* 1′ 45″.333; *Epoch* 1822.80.

Other observations are,

1782.46; Position 5° 46′ *nf*; H. Catalogue of 1782.
1819.70; 10 40 *nf*; Struve, Dorpat Obs. ii. p. 163; Obs. 6, 70, 120.

No. CC. R. A. 15h 10m; Decl. 11° 7′ N.

H. C. 470; Struve, 481;

Double; 7 and 8 magnitudes.

May 21, 1823.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
90—5.50	S	44. 6	S
6.14	S	43. 0	S
5.25	S	42. 3	S
6.15	S	42. 2	S
6.37	S	42. 5	S
Mean — 6. 4		Mean = 42.80	
		Z = — 0.72	
		42.08	

Position = 83° 56′ *sf*
Distance = 13″.290

H. C. 470; and STRUVE, 481, continued.

Position.		Distance. Parts.
° ° ′	June 6, 1823.	
90—4.15 } H	Five-feet Equatorial.	44. 3 } H
4.31	7 and 8 magnitudes. H.	42. 5
5.23	*sf*	41. 3
6.30		43. 5
5.40		44. 2
Mean — 5.16	Position = 84° 44′ *sf*	Mean = 43.16
	Distance = 13″.246	Z = — 1.22
		41.94

Mean result.

Position 84° 20′ *sf*; *Distance* 13″.268.

No. CCI. R. A. $15^h\ 16^m$; Decl. 30° 57′ N.

η Coronæ Borealis; STRUVE, 483; I. 16;

Double; nearly equal.

Position.	
° ′	June 19, 1822.
65.40 } S	Five-feet Equatorial.
65. 5	*nf*
65. 0	
Mean = 65.15	Position = 65° 15′ *nf*

Position.	
° ′	June 5, 1823.
65.15 } S	Five-feet Equatorial.
65.50	*nf*
67.10	
66.20	6 and 6½ magnitudes.
Mean = 66. 9	Position = 66° 9′ *nf*

η Coronæ Borealis continued.

June 5.

Seven-feet Equatorial.

Position. ° ′		Distance. Parts.	
61. 0	S	7. 7	S
63.17	S	8. 2	S
64.35	S	9. 1	S
64.32	S	9. 5	S
64.21	S	8. 8	S
65.15	S	8. 2	S
63.22	S	8. 7	S
		8. 6	S
64.33	H	6. 8	H
61.15	H	5. 9	H
60.45	H	7. 0	H
61.30	H	6. 2	H
62. 0	H	6. 4	H
		7. 2	H
Mean = 63. 2		Mean = 7.73	
		Z = − 1.17	
		6.56	

Position = 63° 2′ *nf*

Distance = 1″.577

The black division between the stars distinctly seen by both observers during these measures.

Mean result.

Position 64° 3′ *nf*: *Distance* 1″.577 ; 1823.27.

Other measures are,

1781.69 ; Position 59° 19′ *nf*; Interval ¼ D. H. Cat. of 1783.
1794.58 : "The Pos^n is *nf*;" Miscellaneous Journal, MS. (H.)
1802.69 ; 89° 40′ *np* ; "Account of the Changes, &c."

From this statement there can be little doubt that the position of 1802 is erroneous, and that the surmised motion of the stars, if any, is much less rapid than that assigned to them in the "Account of Changes," &c. The distance appears to have undergone no sensible change.

No. CCII. R. A. $15^h\ 18^m$; Decl. 8° 41′ S.

H. C. 288; STRUVE, 487;

Double; 6 and 7 magnitudes.

May 21, 1823.

Five-feet Equatorial.

sf

Position.	
° ° ′	
90—45.30	S
45.33	S
45.30	S
45.43	S
45.40	S
Mean — 45.35	

Position = 44° 25′ *sf*

June 6, 1823.

Five-feet Equatorial.

sf

Position.	
° ° ′	
90—44.32	H
45. 5	H
45.40	H
44.40	H
44.52	H
Mean — 44.58	

Distance. Parts.	
164. 6	H
163. 8	H
166. 0	H
165. 0	H
166. 5	H
Mean = 165.18	
Z = — 1.22	
163.96	

Position = 45° 2′ *sf*

Distance = 51″.782.

July 11, 1823.

Seven-feet Equatorial.

sf

Position.	
° ° ′	
90—45.32	S
45.40	S
44.45	S
46. 0	S
Mean — 45.29	

Distance. Parts.	
214. 0	S
214. 0	S
215. 5	S
217. 5	S
217. 5	S
217. 4	S
216. 7	S
218. 5	S
Mean = 216.39	
Z = — 1.18	
215.21	

Position = 44° 31′ *sf*

Distance = 51″.746

Stars $1\frac{1}{4}$ hour west of meridian.

Mean result.

Position 44° 39′ *sf*; *Distance* 51″.760; 1823.44.

No. CCIII. R. A. 15^h 18^m; Decl. $37°$ $59'$ N.

(*sf* μ Bootis); STRUVE, 485; I. 17;

A very close double star—in the Five-feet Equatorial with a a power of 133 it is seen elongated, but 303 shows it decidedly double. A power of 179 applied to the Seven-feet, shows the discs of the two stars in contact; but 273 distinctly separates them. This double star is a severe test for a telescope, and is easily found by means of μ Bootis.

May 23, 1823.
Seven-feet Equatorial.
7 and 9 magnitudes.
n p

Position.		Distance. Parts.
° ° ′		
90—25.30		7. 0
26. 0		7. 5
26.30		8. 8
29.30 S		9. 5 S
28.40		10. 0
28. 0		9. 5
28. 0	Position = 62° 33′ *n p*	
Mean — 27.27	Distance = 1″.781	Mean = 8.72
		Z = — 1.31
		7.41

May 25, 1823.
Seven-feet Equatorial.
n p

Position.

° ° ′
90—26.30 Mr. TROUGHTON.
25.30 S.

Mean — 26. 0

Position = 64° 0′ *np*

Night unfavorable.

June 5, 1823.
Five-feet Equatorial.
np

Position.

° ° ′
90—25.45
25.50
28. 0
26 45 S
25. 0
26.12
25.30

Mean — 26. 9

Position = 63° 51′ *np*

Stars admirably defined. (S)

No. CCII. R. A. $15^h\ 18^m$; Decl. $8°\ 41'$ S.

H. C. 288; STRUVE, 487;

Double; 6 and 7 magnitudes.

May 21, 1823.
Five-feet Equatorial.
sf

Position.	
° ° ′	
90—45.30	S
45.33	S
45.30	S
45.43	S
45.40	S
Mean — 45.35	

Position = 44° 25′ *sf*

June 6, 1823.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
° ° ′			
90—44.32	H	164. 6	H
45. 5	H	163. 8	H
45.40	H	166. 0	H
44.40	H	165. 0	H
44.52	H	166. 5	H
Mean — 44.58		Mean = 165.18	
		Z = — 1.22	
		163.96	

Position = 45° 2′ *sf*
Distance = 51″.782.

July 11, 1823.
Seven-feet Equatorial.
sf

Position.		Distance. Parts.	
° ° ′			
90—45.32	S	214. 0	S
45.40	S	214. 0	S
44.45	S	215. 5	S
46. 0	S	217. 5	S
		217. 5	S
		217. 4	S
		216. 7	S
		218. 5	S
Mean — 45.29		Mean = 216.39	
		Z = — 1.18	
		215.21	

Position = 44° 31′ *sf*
Distance = 51″.746

Stars 1¼ hour west of meridian.

Mean result.

Position 44° 39′ *sf*; *Distance* 51″.760; 1823.44.

No. CCIII. R. A. $15^h\ 18^m$; Decl. $37°\ 59'$ N.

($sf\ \mu$ Bootis); STRUVE, 485; I. 17;

A very close double star—in the Five-feet Equatorial with a power of 133 it is seen elongated, but 303 shows it decidedly double. A power of 179 applied to the Seven-feet, shows the discs of the two stars in contact; but 273 distinctly separates them. This double star is a severe test for a telescope, and is easily found by means of μ Bootis.

May 23, 1823.
Seven-feet Equatorial.
7 and 9 magnitudes.
n p

Position.		Distance. Parts.	
° ° ′			
90—25.30	S	7. 0	S
26. 0		7. 5	
26.30		8. 8	
29.30		9. 5	
28.40		10. 0	
28. 0		9. 5	
28. 0			
Mean — 27.27		Mean = 8.72	
		Z = — 1.31	
		7.41	

Position = $62°\ 33'$ *n p*
Distance = $1''.781$

May 25, 1823.
Seven-feet Equatorial.
n p

Position.	
° ° ′	
90—26.30	Mr. TROUGHTON.
25.30	S.
Mean — 26. 0	

Position = $64°\ 0'$ *np*

Night unfavorable.

June 5, 1823.
Five-feet Equatorial.
np

Position.	
° ° ′	
90—25.45	S
25.50	
28. 0	
26 45	
25. 0	
26.12	
25.30	
Mean — 26. 9	

Position = $63°\ 51'$ *np*

Stars admirably defined. (S)

($sf\,\mu$ Bootis) continued.

Five-feet Equatorial.

June 5, 1823.

° ° ′	
90—22.57	H
29.10	H
Mean — 26.4	

1st Position = 63° 56′ *np*
2d Position = 64 25 *np*
Distance = 1″.522

Seven-feet Equatorial.

June 5, 1823.

n p

Position. ° ° ′		Distance. Parts.	
90—27.47	H	7. 2	H
22.30	H	7. 0	H
24. 0	H	7. 9	H
27.55	H	8. 4	H
28. 0	H	7. 0	H
27.20	H	7. 5	H
23. 0	H		
24.10	H		
Mean — 25.35		Mean = 7.50	
		Z = − 1.17	
		6.33	

Mean result.

Position 63° 42′ *np* ; *Distance* 1″.652 ; 1823.41.

Other measures are,

1782.68 ; Position 87° 14′ *np* ; MS. Also "Account of Changes," &c,
1802.66 ; 76 14 *np* ; Ditto, Ditto, &c.
1821.78 ; 62 3 *np* ; STRUVE, Dorpat Obs. Vol. 3. Vide ZACH. viii. p. 525.

The change in the position of the small star here is established by indisputable evidence; the star μ being fortunately placed at a very convenient distance to serve as a mark of reference, and nearly in the direction of the small star, being about 81° *np*. In 1781 it was remarked by Sir W. H. that the small star followed the line joining the large one and μ, and in 1802 that it had changed sides, and preceded the same line. Our observations and M. STRUVE's fully confirm this change. In the interval of 19.98 years between the observations of 1782 and 1802, the motion observed was 11°, and in the additional period of 20.75 years, a further motion in the same direction of 12°.55 appears to have taken

(sf μ Bootis) continued.

place, the distance remaining nearly the same. A more exact coincidence could hardly have happened. If this double star be a binary system, of which there can be little doubt, its period is about 622 years, and the most probable mean annual motion is 0°.5783, in the direction *npsf*, or retrograde.

Whether this combined system have a motion in space, or not, may be perhaps best ascertained by comparing its place now, and hereafter, with μ, and the data for this comparison will be found under the head of that star, as follows.

No. CCIV. R. A. $15^h\ 18^m$; Decl. 38° 1′ N.

μ Bootis; Struve, 486; VI. 17;

Double; pretty unequal; both white.

May 9, 1821.

Five-feet Equatorial.

sf

Parts.	
90—8. 33	H
7. 39	H
8. 50	H
8.41	S
7.30	S
7.40	S
Mean = 8. 9	

Position = 81° 51′ *sf*

Distance = 1′ 48″.978

Distance. Parts.	
344. 2	H
346. 0	H
344. 5	H
345. 0	S
345. 6	S
345. 7	S
Mean = 345.17	
Z = — 0.11	
345.06	

Difference of Declination of the two stars.

July 9, 1823.

Five-feet Equatorial.

Position. ° ′	
337.7	S
339.3	S
340.3	S
339.8	S
342.3	S
342.5	S
340.2	S
341.2	S
339.8	S
338.3	S
339.6	S
340.0	S
Mean = 340.08	
Z = — 1.40	
338.68	

Difference of Declination = 1′ 46″.962.

Whence, with the foregoing angle of position, we find,

Distance = 1′ 48″.050.

Mean. Position 81° 51′ *sf*; *Distance* = 1′ 48″.539; 1821.35.

Other measures are

1781.81.	80 25 *sf*;	H. Catal. of 1782.
1819.85.	82 54 *sf*;	Struve, Dorpat Obs. ii. p. 166. Obs. 121.
1821.78.	82 36 *sf*;	D°. Dorpat Obs. iii.; reported by Zach. Corr. Astron.
1821.78.		Distance = 1′ 48″.733; D°. D°.; computed from Δ decl. = 1′ 47″.645.

The relative positions of the large and small star appears then not to have varied (at least as far as angle is concerned) since 1781. This is a point of some importance, as the rotation of the small star (which is itself a close double star) is established by this fact. On the other hand, if the proper motions assigned by Piazzi (— 0″.30 in R. A. and + 0″.16 in declination) be correct, this fact would go to establish a connexion between the two stars; for supposing the small star at rest, the space passed over in its path by the large one amounts, in 40 years, to 13″.5, which being inclined at an angle of 28° to the parallel in a *np* direction, would subtend at the small one an angle of 5° 49′, a quantity which could not have escaped measurement in so distant a star; either therefore Piazzi's proper motions are erroneous, or the two stars have a common proper motion.

No. CCV. R. A. $15^h\ 26^m$; Decl. $11°\ 9'$ N.

δ Serpentis; Struve, 488; I. 42.

Double; both blue.

April 28, 1821.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′ 68.42	H	11. 0	H
69. 1	H	9. 5	H
69.45	H	9. 2	H
71.15	S	10. 9	H
72. 0	S	9. 4	H
72. 5	S	9. 4	S
72.10	S	8. 8	S
71.35	H	9. 6	S
69.30	H	9. 9	S
69.32	H	10. 1	S
70.10	H	Mean = 9.78	
70.39	S	Z = − 0.11	
70.45	S	9.67	
71.30	S		
Mean = 70.37			

Position $= 70°.37'$ *sp*

Distance $= ''3.053$

This is one of the stars enumerated in Sir William Herschel's account of changes in the relative situations of double stars as having a considerable angular motion. This is fully confirmed by the present observations, as the following statement will show.

1782.99.	Position 42° 48′ *sp*;	Interval $\frac{1}{4}$ to $\frac{3}{4}$ diam. of S; H. Catal. of 1785.
1802.10.	61 27 *sp*;	H. Account of the Changes, &c.
1819.70.	67 41 *sp*;	Struve, Additamenta, p. 190.
1820.12.	71 0 *sp*;	D°. Dorpat Obs. vol. iii.; reported by Zach.
1821.33.	70 37 *sp*;	H. and S. ut supra.

M. Struve suspects the distance to have increased. An interval of $\frac{1}{2}$ diameter of the small star would correspond to a central distance of about $2''\frac{1}{4}$ or $2\frac{1}{2}$. M. Struve measured it in 1819, and found it $3''.42$, a little larger than ours, but his measure was taken with a projection micrometer, and may be less accurate on that account; yet on the whole

there does appear an increase of distance. The angular velocity has undergone a considerable diminution, and as this corresponds with the increased distance, the orbit is probably elliptic, and so situated as to allow its ellipticity being visible without distortion. The mean annual motion is — 0°.726, or retrograde.

CCVI. R. A. $15^h\ 30^m$; Decl. 8° 11′ S.

178 BODE Libræ; STRUVE 490; 33 of the 145.

Double; nearly equal; each 8 or 9 magnitudes.

May 28, 1822.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.	
84.25	S	42. 0	S
83.45	S	40. 5	S
83.55	S	41. 0	S
84. 5	S	41. 8	S
84.28	S	41. 4	S
82.40	H	41. 8	H
82. 0	H	41. 1	H
83.32	H	39. 9	H
83.41	H	42. 3	H
83. 0	H	41. 6	H
Mean = 83.33		Mean = 41.34	
		Z = + 0.57	
		41.91	

Position = 83°.33′ *sp*

Distance = 13″.236.

May 1, 1823.

Five-feet Equatorial.

8 and 8 $\frac{1}{10}$ magnitudes.

As nearly equal as possible *sp*

Position. ° ′		Distance. Parts.	
79.43	S	40. 8	S
81.40	S	37. 5	S
82. 5	S	35. 3	S
82.45	S	36. 8	S
82.27	S	37. 7	S
81.57	S	38. 5	S
Mean — 81.46		Mean = 37.77	
		Z = + 0.14	
		37.91	

Position = 81°.46′ *sp*

Distance = 11″.972.

Position.	May 3, 1823.	Distance. Parts.
° ′	Five-feet Equatorial.	
82.10 H	As nearly equal as possible; $7\frac{1}{2}$ magnitudes *sp*	36. 0 H
82.38 H		36. 5 H
82.12 H		39. 0 H
82.50 H		38. 0 H
82.15 H	Position = 82° 25′ *sp*	37. 4 H
Mean = 82.25	Distance = 11″.730.	Mean = 37.38
		Z = − 0.24
		37.14

Mean result.

Position 82° 46′ *sp*; 1823.02; *Distance* 11″.862; *Epoch* 1823.33.

The distances of May 28, 1822, are rejected in taking the mean, the difference of 1″.4 between those measures and the mean of the other observations being excessive. In such a case the independent yet coincident measures of two observers on different nights must have the preference.

No. CCVII. R. A. $15^h\ 33^m$; Decl. 10° 33′ S.

(H. C. 469); Struve, 492.

Nearly equal; $8\frac{1}{2}$ and 9th magnitudes.

Position	June 6, 1823.	Distance. Parts.
° ′	Seven-feet Equatorial.	
37. 0 S	*nf*	113. 0 S
36.20 S		114. 0 S
37.28 S		112. 2 S
37.15 S		113. 3 S
37.40 S		112. 0 S
37.44 H		118. 0 H
39.10 H		112. 0 H
40.15 H	Position = 38° 5′ *nf*	111. 0 H
38. 0 H	Distance = 27″.066.	114. 0 H
40. 2 H		110. 0 H
Mean = 38. 5		Mean = 112.95
		Z = − 0.38
		112.57

No. CCVIII. R. A. $15^h 33^m$; Decl. $37^\circ 11'$ N.

ζ Coronæ Borealis; STRUVE, 491; II. 8;

7 and $7\frac{1}{2}$ magnitudes; large, white; small, blue.

March 27, 1821.

Five-feet Equatorial.

np

Position.	
° ° ′	
90—58. 0	S
58.10	S
56. 0	S
56.52	H
58.30	H
60.30	H
Mean — 58. 0	

Position $= 32^\circ\ 0'$ *np*.

April 27, 1821.

Both blue, but the small one the deepest colour.

Five-feet Equatorial.

np

Position.	Distance. Parts.	
° ° ′		
90—58 55	20. 5	S
59. 0	22. 8	S
59. 4	24. 0	S
59.40	21. 2	S
60. 0	24. 1	S
59.20	24. 1	S
61. 0	22. 0	H
61.21	23. 1	H
61.15	23. 0	H
60.41	21. 0	H
61.24	21. 7	H
61.25	23. 0	H
Mean — 60.15	Mean = 22. 54	
	Z = — 0.11	
	22.43	

Position $= 29^\circ.45'$ *np*

Distance $= 7''.083$.

May 1, 1823.

Five-feet Equatorial.

np

Position.	Distance. Parts.	
° ° ′		
90—57.40	24. 8	S
59.18	23. 0	S
54.47	25. 2	S
55.15	22. 3	S
60. 0	20. 8	S
57. 7	24. 5	S
Mean = —57.21	Mean = 23.43	
	Z = + 0.14	
	23.57	

Position $= 32^\circ\ 39'$ *np*

Distance $= 7''.444$.

ζ Coronæ Borealis continued.

Position.	May 3, 1823.	Distance. Parts.
90°—58°.28′ ⎫	Five-feet Equatorial.	23. 0 ⎫
58.50 ⎪	6 and $6\frac{1}{2}$ magnitudes. (H)	21. 4 ⎪
57.30 ⎬ H	*n p*	23. 2 ⎬ H
60.48 ⎪		23. 0 ⎪
61.35 ⎭		22. 4 ⎭
Mean — 59.16	Position = 30°. 34′ *n p*	Mean = 22.60
	Distance = 7″.062	Z = — 0.24
		22.36

Mean.

Position 30° 57′ *np* ; *Distance* 7″.168 ; 1822.30.

Other observations are,

1781.70. Position 25° 51′ *np* ; Dist. = 5″.468. H. Cat. of 1782.

The distance here set down is a mean of two observations, 4″.687 and 6″.25 ; and in the MS. it is expressly stated that (in the former measure) both diameters are included. The measure itself is probably too small, as the vacancy between the stars is estimated at 3 D, and the diameter of a star of the 6th magnitude can hardly be less than 1″$\frac{1}{4}$ or 1″$\frac{1}{2}$; 6″.25 is therefore probably a better measure, and would give 4″.75 for the central measure in 1781.

1819.47. Position 29° 54′ *n p* ; Distance = 7″.25. Struve, Additam. 190.
1822.60. Distance = 6″.07. D°. Astronomische Nachr. N°. 22.

On the whole therefore the distance appears to have undergone some small increase, while the position also seems liable to a slow variation in a direct sense (*n f s p*).

No. CCIX. R. A. $15^h 40^m$; Decl. $36°.59'$ N.

(32 of the 145 *); STRUVE, 491; H. C. 61.

7th and 9th magnitudes.

May 1, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
° ′			
90—37. 2	S	102. 2	S
36.34		99. 3	
36.27		99. 3	
37.14		98. 2	
36.50		99. 1	
35.50		99. 9	
Mean — 36.39		Mean = 99.67	
		Z = + 0.14	
		99.81	

Position $= 53° 21'$ *np*
Distance $= 31''.523$

May 3, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
° ° ′			
90—34.58	H	101.1	H
35.25		98.4	
36. 2		102.0	
36. 0		101.2	
36.50		98.1	
Mean — 35.51		Mean = 100.14	
		Z = — 0.24	
		99.90	

Position $= 54° 9'$ *np*
Distance $= 31''.511$.

Mean result.

Position $53° 43'$ *np*; *Distance* $= 31''.517$: 1823.33.

* The P. D. of this star is stated in the catalogue of 145 new double stars as being 58° 52′; but this is manifestly erroneous, as its place is settled by the well-known star ζ Coronæ, which it is said to follow $7^m 6^s$, being 0° 13′ more to the south. This description agrees exactly with the place of the star as observed by us above.

No. CCX. R. A. $15^h 40^m$; Decl. 81° 2′ N.

(π^1 Ursæ Minoris; Struve, 495; IV. 90;

6th and 7th magnitudes.

June 6, 1823.

Seven-feet Equatorial.

nf

Position.		Distance. Parts.	
° ′			
6.29	S	130. 3	S
7.24		131. 0	
6.49		130. 3	
7.24		131. 2	
6.54		130. 5	
6.49		130. 0	
Mean = 6.58		Mean = 130.55	
		Z = − 0.38	
		130.17	

Position = 6° 58′ *nf*

Distance = 31″.298.

June 18, 1823.

Five-feet Equatorial.

nf

6th and $6\frac{1}{2}$ magnitudes. H.

Position.		Distance. Parts.	
° ′			
6.15	H	97. 5	H
7. 0		99. 0	
6.18		97. 8	
5.55		99. 3	
7.15		97. 5	
6.10			
Mean = 6.29		Mean = 98.22	
		Z = − 0.36	
		97.86	

Position = 6° 29′ *nf*

Distance = 30″.907

Mean result.

Position 6° 43′ *nf*; *Distance* 31″.102; 1823.45.

Other observations are,

1783.51; Position 3° 12′*nf*; Distance 26″.40; H. Cat. of 1785; but a measure of distance taken October 12, 1782 (MS.), says, "exactly 30″ by the micrometer;" and the other is preferred for no obvious reason, in the printed catalogue:

π^1 Ursæ Minoris continued.

1815.08. According to M. STRUVE (Dorpat Obs. vol. i. Catalogus primus, Stella, 139), the difference of R. A. in time = $12^s.89$, equivalent to $30''.107$ on the parallel. The angle of position can be only deduced from two estimations of the ratio of Δ R. A. to Δ declination, and would come out 13° 24′; but this is assuredly wrong. The distance on the parallel, computed from our mean result above stated, comes out $30''.889$.

No. CCXI. R. A. $15^h\ 47^m$; Decl. 1° 39′ S.

II. 85; STRUVE, 496.

Double; 8th and 9th magnitudes.

May 21, 1823.

Five-feet Equatorial.

np

Position.	Distance. Parts.
90°—35°.45′	21. 2
32.15	22. 8
33.15	23. 2
33.35	22. 3
33. 7	21. 9
32.45	
S	S
Mean — 33.27	Mean = 22.28
	Z = − 0.72
	21.56

Position = 56° 33′ *np*
Distance = $6''.809$.

June 12, 1823.

Large, white; small, blue.

Seven-feet Equatorial.

7th and 10th magnitudes.

np

Position.	Distance. Parts.
90°—37°. 0′	27. 0
35.30	30. 0
36.30	29. 6
37.30	27. 2
	28. 8
H	H
Mean — 36.38	Mean = 28.52
	Z = − 0.09
	28.43

Position = 53°.22′ *np*
Distance = $6''.835$.

Measures very difficult (H)

Mean.

Position 55° 17′ *np*; *Distance* $6''.822$; 1823.42.

II. 85 continued.

This star has undergone a change of 9° 8′ in its angle of position; Sir W. HERSCHEL's measure in 1783.33 being 46° 9′ *np*. The distance, too, is certainly increased. It is called a near star of the second class, and the distance of the discs is stated at 1 diam. with 227, and 2 with 460. This, in stars of the 8th and 9th magnitudes, can hardly correspond to more than $3\frac{1}{2}$ or 4″—at the very utmost 5″ distance, between the centers.

No. CCXII. R. A. $15^h\ 48^m$; Decl. 3° 56′ N.
III. 103; STRUVE, 497;
Double; 7th and 9th magnitudes.

May 21, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
90°—36°. 0′	S	35. 5	S
37.30	S	34. 5	S
35.15	S	35. 3	S
37.40	S	36. 2	S
37.25	S	36. 0	S
Mean = 36.46		Mean = 35.50	
		Z = − 0.72	
		34.78	

Position = 53° 14′ *np*
Distance = 10″.984.

June 6, 1823.
Five-feet Equatorial.
np

Position.	
90°—36°.5′	H
40.0	H
Mean — 38.3	

Position = 51° 57′ *np*

The star too low to procure more measures. H.

June 12, 1823.
Seven-feet Equatorial.
7 and 9 magnitudes. H.
np

Position.		Distance. Parts.	
90°—37°. 0′	H	41. 4	H
38.20	H	42. 5	H
36.30	H	45. 5	H
37. 5	H	44. 0	H
36.30	H	42. 2	H
Mean — 37. 5		Mean = 43.12	
		Z = − 0. 9	
		43.03	

Position = 52° 55′ *np*
Distance = 10″.346.

III. 103 continued.

Mean result, rejecting the measures of June 6.

Position 58° 4′ *np*; *Distance* 10″.665; 1823.46.

Other measures.

1783.63; Pos. 50° 12′ *np*; Dist. 12″.46; H. Catal. of 1785, by a mean of two measures.

No. CCXIII. R. A. $15^h\ 49^m$; Decl. 19° 24′ S.

H. C. 343; STRUVE, 498;

7½ and 7¾ magnitudes; bear but very feeble illumination.

May 21, 1823.
Five-feet Equatorial.
np

Position. ° ′		Distance. Parts.
90—37. 0	S	66. 0±
38.15		64. 0±
37.35		61. 0±
37.50		63. 5±
38.30		64. 0±
Mean — 37.50		Mean = 63.70
		Z = — 0.72
		62.98

Position = 52° 10′ *np*
Distance = 19″.890.

Measures unsatisfactory; stars very faint and low. S.

No. CCXIV. R. A. $15^h\ 52^m$; Decl. 17° 54′ N.

V. 126; STRUVE, 500;

Very nearly equal; 8 and 8¼ magnitudes.

June 11, 1823.
Seven-feet Equatorial.
sp

Position. ° ′		Distance. Parts.
53.35	S	146. 0
55. 3		145. 7
53.12		147. 0
53.55		146. 5
54.41		147. 1
54.15		148. 5
53.45		
Mean = 54. 4		Mean = 146.80
		Z = — 0.29
		146.51

Position = 54° 4′ *sp*
Distance = 35″.226.

V. 126 continued.

June 12, 1823.
Seven-feet Equatorial.
Very nearly equal.
8th magnitude. H.
nf?

Position.		Distance. Parts.	
52°.10′	H	138. 5	H
53.15		146. 0	
52.15		139. 0	
52. 1		144. 0	
54.15		150. 0	
		147. 0	
Mean = 52.47		Mean = 144.08	
		Z = — 0.09	
		143.99	

Position = 52° 47′ *nf?*
Distance = 34″.621.

Mean.

Position 53° 25′ *sp* ; *Distance* 34″.923 ; 1823.45.

Other measures,

Pos. 52° 6′ *sp* ; Dist. 37″.850 ; 1783.64 ; H. Catal. of 1785.

The distance is called " exact, but full."

No. CCXV. R. A. 15^h 54′ ; Decl. 10° 56′ S.

Parvula prope ξ Scorpii ; STRUVE, 505 ; II. 21 ;

8 and 8½ magnitudes.

June 6, 1823.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
90°—78′. 5	S	36. 3	S
78.40		35. 3	
79.15		37. 2	
79.50		36. 7	
80.15		36. 3	
78. 0	H	33. 0	H
78.10		34. 0	
80. 8		37. 0	
78.17		34. 9	
79.58		37. 3	
79.30			
Mean — 79. 6		Mean = 35.80	
		Z = — 1.22	
		34.58	

Position = 10°.54′ *sf*
Distance = 10″.921.

A third star *np* of the 4th magnitude. Measures with the preceding star of the close set.

Parvula prope ξ Scorpii; STRUVE, 505; II. 21; continued.

Position.	*n p*	Distance. Parts.
90°—11°.21′	Position = 78° 39′ single measure.	890. 0
	Distance = 4′ 41″.533	895. 3
		Mean = 892.56
		Z = — 1.22
		891.43

June 13, 1822.

Five-feet Equatorial.

s f

Position.		Distance. Parts.
90°—78°.58′		35. 0
79.15		33. 2
78.12		31. 1 H
78.46	Position = 11° 4′ *sf*	31. 2
79.30		34. 1
Mean — 78.56	Distance = 10″.343.	Mean = 32.92
		Z = — 0.17
		32.75

June 18, 1822.

Five-feet Equatorial.

s f

Nearly equal.

Position.		Distance. Parts.
90°—79°. 8′		34. 0
78.40		32. 5
79.10 S		33. 5 S
79. 6		34. 2
79.30	Position = 10° 55′ *s f*	35. 0
Mean = 79. 5	Distance = 10″.220.	Mean = 33.84
		Z = — 1.48
		32.36

Measures extremely satisfactory. S.

Mean.

Position 10° 57′ *sf*; *Distance* 10″.601; *Epoch* 1822.95.

This is the obscure double star in the same field with ξ Libræ, which is itself double, and whose relative position and distance with respect to this are determined in the last observation. The small star of ξ was apparently overlooked, the instrument having been set by M. STRUVE's Catalogue, in which *this* star is entered without class or number, and was only identified with the star II. 21, by a comparison of places, &c.

No. CCXVI. R. A. $15^h\ 54^m$; Decl. $10°\ 52'$ S.

ξ Scorpii; II. 20;

Position.		Distance. Parts.
° ′	June 13, 1822.	
12. 2 H	Five-feet Equatorial.	22. 1 H
10.51 H	4 and 8 magnitudes.	22. 0 H
12.45 H	*nf*	20. 6 H
11.12 H		22. 3 H
12.51 H		20. 1 H
12.50 H		22. 5 H
Mean = 12. 5	Position = 12° 5′ *nf*	Mean = 21.60
	Distance = 6″.767.	Z = − 0.17
		21.43

Position.		Distance. Parts.
° ′	June 18, 1822.	
10.30 S	Five-feet Equatorial.	21. 8 S
10.25 S	*nf*	23. 0 S
10.40 S		23. 5 S
11. 5 S		23. 2 S
12.10 S		23. 5 S
12. 5 S	Position = 11° 9′ *nf*	22. 5 S
Mean = 11. 9	Distance = 6″.771	Mean = 22.92
		Z = − 1.48
	Measures extremely satisfactory. S.	21.44

Mean.

Position 11° 37′ *nf*; *Distance* 6″.769; *Epoch* 1822.46.

Other measures are,

1782.36; Position 1° 23′ *nf*; Distance 6″.38 (too large); H. Catalogue of 1782.
1819.50; 21 0 *nf*; 9 .31; Struve, Dorpat. Obs. ii. Addit. 190.

M. Struve's angle being determined by estimated ratios of the difference of R. A. to that of Declin. cannot be placed much reliance on; but the difference between his distance and ours is unaccountably great. The large star of ξ has not been seen double by us. This is perhaps a binary system, with a mean annual motion of − 0°.256.

No. CCXVII. R. A. $15^h\ 55^m$; Decl. $19°\ 18'$ S.

β Scorpii; STRUVE, 506; III. 7;

Pretty unequal; large, white; small, blue.

April 28, 1821.

Five-feet Equatorial.

nf

Position = 69° 6′ *nf*; Distance = 13″.482 single measures.

April 11, 1823.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
64.40	S	43. 0	S
63.46	S	45. 5	S
66. 0	S	44. 5	S
64.50	S	46. 0	S
64.28	S	44. 4	S
63.12	H	45. 3	H
62.20	H	46. 0	H
61.30	H	43. 0	H
63.35	H	44. 8	H
62.27	H	43. 9	H
62.33	H		
61.50	H		
62. 0	H		
65. 0	S		
64.20	S		
Mean = 63.30		Mean = 44.64	
		Z = − 1.38	
		43.26	

Position = 63° 30′ *nf*

Distance = 13″.662.

Mean result, rejecting the angle of April 28.

Position 63° 30′ *nf*; *Distance* 13″.650; 1823.28.

Other measures are,

1782.29; Pos. 64° 51′ *nf*; Dist. 14″.375; H. Cat. of 1783.

1802.31; 65 3 *nf*; Ditto. MS.

This star therefore has undergone no sensible change.

No. CCXVIII. R. A. $15^h\ 58^m$; Decl. $13°\ 49'$ N.

H. C. 159; Struve, 507;

Double; 6 and 8 magnitudes.

May 26, 1823.
Five-feet Equatorial.
n p

Position.		Distance. Parts.	
° ° '			
90—31. 0	S	101. 5	S
30.40	S	101. 2	S
30.44	S	100. 0	S
33.10	S	101. 3	S
31.50	S	101. 2	S
32. 0	S	101. 0	S
Mean — 31.34		Mean = 101.03	
		Z = — 0.11	
		100.92	

Position = 58° 26′ *np*
Distance = 31″.872.

June 4, 1823.
Five-feet Equatorial.
Large, yellowish white; small, blue.
7 and 8 magnitudes.
n p

Position.		Distance. Parts.	
° '			
90—30. 4	H	103. 0	H
29.17	H	101. 9	H
30.12	H	104. 0	H
30.35	H	104. 3	H
31.30	H	100. 0	H
32.25	H	104. 5	H
31.50	H		
Mean — 30.50		Mean = 102.95	
		Z = — 1.63	
		101.32	

Position = 59° 10′ *np*
Distance = 31″.999

Mean result.

Position 58° 44′ *np*; *Distance* 31″.935; *Epoch* 1823.42.

No. CCXIX. R. A. $16^h\ 0'$; Decl. $17°\ 32'$ N.

κ Herculis; STRUVE, 508; V 8;

Double; pretty unequal; large, white; small, reddish.

Position.		May 21, 1821.	Distance. Parts.	
° ′				
79.11	H	Five-feet Equatorial.	98. 0	H
79.37		*nf*	100. 4	
80.14			99. 6	
80.30			101. 5	
81.34	S		99. 3	S
81.18		Position = 80° 25′ *nf*	98. 0	
80.37		Distance = 31″.169.	99. 8	
80.20			100. 9	
Mean = 80.25			Mean = 99.69	
			Z = − 0.05	
			99.64	

Other observations are,

1781.82; Pos.* 82° 23′ *nf*; Dist. (1782.47) 39″.98, well taken. H. C. of 1782 & MS.
1800.00; 77 12; Dist. = 32″.710; PIAZZI, from Δ R. A. = 7″.6, and Δ decl. = 31″.9.
1819.64; 78 46 *nf*; STRUVE, Obs. 46, 71, 88, Dorp. Obs. ii.

The angle unvaried, but a diminution of distance to the amount of 8″.711.

* In the printed copy it is 79° 37′. The mistake has been corrected by reference to the original observations.

No. CCXX. R. A. $16^h\ 2^m$; Decl. 18° 58′ S.

ν Scorpii; STRUVE, 509; V. 6.

Double; pretty unequal; large, white; small, blue.

May 15, 1821.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
° ° ′ 90—22. 3	H	130. 8	H
22.30	H	128. 0	H
21.37	H	130. 0	H
20.50	H	131. 5	H
22. 2	S	130. 0	S
21.30	S	128. 0	S
21.55	S	127. 5	S
21.54	S	128. 5	S
Mean = 21.48		Mean = 129.29	
		Z = — 0.05	
		129.24	

Position = 68° 12′ *np*
Distance = 40″.817.

1782.30; Pos. 64° 51′ *np*; Dist. 38″.333; H. Catal. of 1782. The angle, which was erroneously cast up in the printed copy, recalculated from the original observations.

No. CCXXI. R. A. $16^h\ 4^m$; Decl. 14° 1′ N.

49 Serpentis; STRUVE, 510; I. 82;

Double; nearly equal; both white.

June 19, 1822.
Five-feet Equatorial.
n p

Distance. Parts.
14. 2
13. 2
13. 5
15. 0
15. 7
14. 9
16. 0
15. 2
16. 0
15. 2
15. 0
Mean = 14.90
Z = — 1.48
13.42

Distance = 4″.238.

49 Serpentis; STRUVE, 510; continued.

Position.			Distance. Parts.	
° ′				
90—47.40	H	April 11, 1823.	12. 8	S
49.30	H	Five-feet Equatorial.	13. 8	S
48. 0	H	*np* or *sf*	12. 9	S
47. 0	H		14. 7	S
47.15	H		14. 0	S
47.30	S		Mean = 13.64	
48.37	S	Position = 41°.57′ *np* or *sf*	Z = − 0.49	
48. 0	S	Distance = 4″.154	13.15	
48.38	S			
48.16	S			
Mean = 48. 3				

Mean.

Position 41° 57′ *np* or *sf*; *Distance* 4″.215; 1823 28.

Other observations are

1783.18. Position 21° 33′ *np* (very exact); H. Catal. of 1785.

1802.39.	32 52 *np*	Mean 1803.32 Pos. 34° 1′ *np*; H. Acc. of changes, &c.
1804.25.	35 10 *np*	
1820.10.	46 33 *np*	STRUVE, Additamenta, p. 190.

The motion of this star, first pointed out by Sir WILLIAM HERSCHEL in 1804, is thus clearly established. The disagreement between our observations and M. STRUVE's is rather more than usual (4° 6′); but the star is close and difficult. The mean annual angular motion is about 0°.510, in the direction *nfsp*, or direct.

No. CCXXII. R. A. 16ʰ 8ᵐ; Decl. 34° 20′ N.

σ Coronæ Borealis; STRUVE, 511; I. 3.

Position.		
° ′		
25.15	H	April 18, 1821.
26.15	H	Five-feet Equatorial.
26.30	H	*n f*
22.30	S	
22.33	S	
22. 0	S	
28.15	H	Position = 24° 45′ *nf*
Mean = 24.45		

σ Coronæ continued.

April 9, 1823.

Five-feet Equatorial.

nf

Position.	
° ′	
24.40	S
21.30	S
Mean —23. 5	

Position = 23°.5′ *nf*

No confidence. H. merely saw it elongated and blotty, but could not separate the stars.

June 5, 1823.

Seven-feet Equatorial.

6th and 7th magnitudes; small star blue.

nf

Position. ° ′	
13. 0	S
13.42	S
13.21	S
12.58	S
12.25	S
12. 5	S
12.40	S
17.30	H
22.30	H
21. 0	H
20. 5	H
16. 0	H
14.35	H
17. 0	H
18. 0	H
19.45	H
15.35	S
16. 5	S
16.14	S
16. 0	S

Position = 16°.1′ *nf*
Distance = 1″.455.

Distance. Parts.	
6. 5	S
8. 0	S
7. 0	S
7. 0	S
6. 7	S
6. 2	S
8. 5	H
7. 9	H
7. 0	H
6. 6	H
8. 7	H
6. 5	H
Mean = 7.22	
Z = — 1.17	
6.05	

July 9, 1823.

Seven-feet Equatorial.

nf

Position. ° ′	
16. 0	S
17. 7	S
16.38	S
16.30	S
17.55	S
17.24	S
23.25	S
18.25	S
19.15	S
22. 0	S
20.45	S
20.45	S
Angle = 18.51	

Mean result.

Position 18°27′ *nf* (39 *measures*; *Distance* 1″.455; *Epoch* 1822.83, rejecting the measures of April 9.

σ Coronæ continued.

The observations of this star, arranged in order of time, are

1781.79.	Position	77° 32′ *np*;	H. Catal. of 1782.
1804.74.		78 36 *nf*;	H. Account of the changes, &c.
1819.60.		40 0 *nf*;	Struve. Additamenta. p. 179.
1821.30.		24 45 *nf*;	H. and S. observed in 1821.
1822.83.		18 27 *nf*;	Dist. 1″.455. H. and S. ut supra.
1823.47.		17 4 *nf*;	H. and S. Mean of Obs. of 1823

We have here an instance of a great and almost sudden acceleration in the angular velocity of the small star. In the interval of 20.95 years elapsed, between 1781 and 1802, the angle described was 23°.86, giving a mean velocity of 1°.139 per annum. In the next interval of 16.86 years the angle described was 38°.60, or 2°.298 a year; while from 1819.6 to 1823.83 the angle described amounted to 22°.55. in 3.23 years, or 6°.982 per annum. This rapid increase of angular velocity has been accompanied with a very sensible diminution of distance. In the catalogue of 1782, the interval between the two stars is described as being full $1\frac{1}{4}$ diameter of the large star, with a power of 227; while, with the same power, M. Struve observed them only $\frac{1}{3}$ diameter asunder; and the same assiduous observer remarks, that the stars ξ Ursæ and 17 Draconis, both of which are set down in the catalogues as closer than σ, are now farther asunder. Our observations corroborate this diminution of distance; σ Coronæ is now a very difficult star to separate, almost equally so with η, and requiring the most favorable

σ Coronæ continued.

circumstances for its measurement. Indeed the distance of the centres is less in σ than in η, a mean of 12 capital observations having given us 1″.455 for the former distance on the 5th of June, 1823, while η, on the same extraordinary night, measured 1′.577; but the greater inequality of the stars of σ fevours their separation.

To explain these phœnomena we may suppose, first, that the orbit is elliptic, and the star approaching its perihelion. But this would require a much greater variation of distance than appears to have taken place, to produce the effect, without the assistance of a second supposition, viz. that of the motion being performed in a plane passing nearly through the eye. Without therefore going into the minutiæ of an elliptic orbit, let us conceive the small star to describe a circle about the large one, in a plane 30° inclined to the visual line, and intersecting the plane of projection in the line S A which joined the two stars at the moment of the first observation. Taking the mean motion in the orbit at 2°.13 per annum, after the lapse of any number t of years from 1781.79, the angle apparently described from A, or the angle A S P will be had by the trigonometrical theorem

$$\tan. \, ASP = \sin 30^\circ . \tan\,(t \times 2^\circ{\cdot}13).$$

And the angle of position f S P will $= 102^\circ\ 28' - $ A S P. If then we calculate the apparent places by this formula for all the times of observation, we get as follows.—

σ Coronæ continued.

Time.	Computed Position.	Observed Position.	Difference.
	° ′		° ′
1781.79	77 32 *np*	77 32 *np*	0 0
1802.74	76 13 *nf*	78 36 *nf*	+2 23
1819.60	30 58 *nf*	40 0 *nf*	+9 2
1821.30	24 9 *nf*	24 45 *nf*	+0 36
1823.43	16 16 *nf*	16 1 *nf*	−0 15
1823.52	15 52 *nf*	18 51 *nf*	−2 59
1822.83	18 38 *nf*	Mean Pos. 18 27 *nf*	−0 11

A moderate ellipticity, and a proper assumption of the place of the perihelion, would probably reconcile the anomalies these differences present, which however, with the exception of that deduced from Mr. STRUVE's observation in 1819, are all small; but the extreme difficulty of the star would reconcile even greater anomalies than these.

No. CCXXIII. R. A. $16^h\ 10^m$; Decl. 29° 36′ N.

υ Coronæ Borealis; STRUVE, 512; V. 37;

Triple; A of the 7th; B of the 13th; C of 12th magnitude.

Position.		Distance.
° ′	April 10, 1823.	Parts.
65.30 } H	Five-feet Equatorial.	285.0
64. 0 }	Measures of A B	Z = − 0.73
Mean = 64.45	*nf*	284.27

Position = 64° 45′ *nf*

Distance = 1′.29″.778.

υ Coronæ Borealis continued.

Measures of AC.

Position.		Distance. Parts.
° ′		
33.30 } H	*nf*	420. 0 H.
34.10 }		Z = − 0.73
Mean = 33.50	Position = 33° 50′ *nf*	419.27
	Distance = 2′ 12″.415.	

Distances of each set very unsatisfactory.

June 11, 1823.

Seven-feet Equatorial.

A of the 3rd ; B of the 13th ; C of the 12th magnitudes.

Each small star bears a very bad illumination.

Measures of AB.

Position.		Distance. Parts.
° ′	*nf*	
66.40		365±
66.30		367± } S
65.40 } S	Position = 66° 22′ *nf*	362±
66. 0	Distance = 1′ 27″.611.	
67. 0		
Mean = 66.22		Mean = 364.67
		Z = − 0.29
		364.38

Measures of AC.

Position.		Distance. Parts.
° ′	*nf*	
37. 5		511. 0
36.45		516. 5
36.15 } S	Position = 36° 29′ *nf*	516. 0 } S
36. 5	Distance = 2′ 4″.022.	519. 0
36.15		518. 0
Mean = 36.29		Mean = 516.10
		Z = − 0.29
		515.81

The measures of each set excessively difficult. S.

υ Coronæ Borealis continued.

Mean result.

AB. *Position* 65° 33′ *nf*; *Distance* 1′ 28″.694; 1823.36.
AC. 35 9 *nf*; 2 6 .420; 1823.36.

In taking the mean, each *set* of observations is supposed of equal weight, except in the distances of AC, where each *single* observation is supposed equally valid.

No. CCXXIV. R. A. 16h 10m; Decl. 25° 9′ S.

20, σ Scorpii; IV. 121;

Double; extremely unequal; 5th and 10th magnitudes.

Position.		Distance.
° ° ′	May 28, 1822.	Parts.
90—85.35 H	Five-feet Equatorial.	59. 0 H
86.30 H	*np*	Z + 0.57
90.30 H		59.57
91.37 H	Position = 0° 46′ *np*	
92. 0 H		
Mean — 89.14	Distance = 18″.813. Little better than conjecture.	

Position.		Distance.
° ° ′	June 13, 1822.	Parts.
90—88.54 H	Five-feet Equatorial.	67. 5 H
89. 0 H	Excessively unequal.	64. 6 H
88.31 H	*np*	68. 1 H
88. 2 H		65. 3 H
88.14 H		67. 4 H
Mean — 88.32	Position = 1° 28′ *np*	Mean = 66.58
	Distance = 20′.973	Z = — 0.17
		66.41

Difficult to measure from position and faintness of the small star. H.

20 σ Scorpii continued.

June 18, 1822.

Five-feet Equatorial.

Position.		Distance. Parts.	
° ° ′			
90—88.50	S	65. 0	S
88.40		64. 5	
88.35		66. 0	
88.40		65. 5	
88.33		66. 5	
Mean — 88.40		Mean = 65.50	
		Z = — 1.48	
		64.02	

Excessively unequal; large, white; small, blue.

np

Position = 1° 20′ *np*
Distance = 20″.218.

The small star is exceedingly difficult to be seen without illumination; with it, however, there is no difficulty in getting good measures. The night exceedingly favourable. The stars as steady as possible. S.

Mean.

Position 1° 11′ *np*; *Distance* 20″.595; *Epoch* 1822.43.

In taking the mean, the distance of May 28 is rejected.

Other measures are,

1783.16; Pos. 0° 0′ "or perhaps a single degree *np*;" Dist. 21″.667; H. Cat. 1785.

CCXXV. R. A. 16ʰ 10ᵐ; Decl. 19° 36′ S.

V. 134; Struve, 514;

Double; nearly equal; 7 and 7¼ magnitudes.

May 26, 1823.

Five-feet Equatorial.

Position.		Distance. Parts.	
° ° ′			
90—25.30	S	148. 8	S
25. 5		149. 2	
25. 0		151. 5	
25.45		150. 3	
25.42		151. 3	
Mean — 25 24		Mean = 150.22	
		Z = — 0.11	
		150.11	

np

Position = 64° 36′ *np*
Distance = 47″.408

V. 134; STRUVE, 514 continued.

June 4, 1823.
Five-feet Equatorial.
$7\frac{1}{4}$ and 7 magnitudes.
np

Position.	Distance. Parts.
° ° ′	
90—24.50 ⎫	147. 4 ⎫
24.30 ⎪	151. 0 ⎪
24.15 ⎬ H	147. 2 ⎬ H
25. 8 ⎪	150. 1 ⎪
24.31 ⎭	148. 7 ⎭
Mean — 24.39	Mean = 148.88
	Z = − 1.63
	147.25

Position = 65° 21′ *np*
Distance = 46″.505

June 29, 1823.
Five-feet Equatorial.

Distance. Parts.
151. 0 ⎫
153. 8 ⎪
149. 0 ⎬ S
149. 0 ⎪
153. 0 ⎪
152. 2 ⎭
Mean = 151.33
Z = − 1.06
150.27

Distance = 47″.458.

Mean.

Position 64° 58′ *np*; *Distance* 47″.120; 1823.42.

Sir W. HERSCHEL gives no angle of this star. The distance in 1783 was 45″.79.

No. CCXXVI. R. A. 16ʰ 10ᵐ; Decl. 19° 40′ S.

IV. 124; STRUVE, 515;

Nearly equal; 8 and $8\frac{1}{4}$ magnitudes.

June 4, 1823.
Five-feet Equatorial.
nf

Position.	Distance. Parts.
° ′	
71.25 ⎫	42. 5 ⎫
70.55 ⎪	45. 3 ⎪
70. 0 ⎪	48. 0 ⎪
71.15 ⎪	46. 3 ⎬ S
72.30 ⎬ S	49. 0 ⎪
71.25 ⎪	46. 4 ⎪
70. 0 ⎪	47. 8 ⎭
68.30 ⎪	
69.30 ⎪	
70. 5 ⎭	
Mean = 70.34	Mean = 46.47
	Z = − 1.63
	44.84

Position = 70° 34′ *nf*
Distance = 14″.162.

IV. 124 continued.

Position.		Distance. Parts.
° ′		
68.30 H	Position = 67° 41′ *nf*	44. 2 H
67. 0 H	Distance = 12″.965.	41. 0 H
67. 5 H		40. 0 H
67.15 H		44. 3 H
68.40 H		43. 7 H
67.35 H		42. 5 H
		43. 1 H
Mean = 67.41		Mean = 42.68
		Z = − 1.63
		41.05

Measures very difficult. H.

Distance. Parts.	
43. 5 S	June 29, 1823.
47. 0 S	Five-feet Equatorial.
42. 2 S	
43. 5 S	
44. 9 S	
45. 8 S	Distance = 13″.712.
Mean = 44.48	
Z = − 1.06	
43.42	

Mean.

Position 69° 29′ *nf*; *Distance* 13″.280 ; 1823.45.
1783.22 ; 62 54 *nf*; 15 .400 ; H. Cat. 1785.

A slight change is perceptible in the angle, and a very sensible diminution (2″.120) in the distance.

No. CCXXVII. R. A. $16^h\ 14^m$; Decl. 19° 35′ N.

γ Herculis ; STRUVE, 516 ; V. 19 ;

Excessively unequal ; large, white ; small, bluish.

Position.	
° ′	
24.47 H	April 18, 1821.
25.24 H	Five-feet Equatorial.
24.35 H	*sp*
26.25 S	
26.45 S	
26. 0 S	Position = 25° 39′ *sp*
Mean = 25.39	

γ Herculis continued.

May 20, 1821.

The small star will bear no illumination in the five-feet equatorial, the measures are only approximate.

Position = 23° ± *sp*

Distance = 39″.5 ±

May 28, 1822.

The small star bears so extremely feeble an illumination, that to procure measures is excessively difficult; indeed it cannot be seen unless the eye is directed to another part of the field. 4 and 15 magnitudes.

Position. ° ′		Five-feet Equatorial.	Distance. Parts.	
27. 2	H	*sp*	117. 0	H
25.15	H		121. 0	H
26.52	H		120. 5	S
25.40	H		119. 7	S
27.10	S	Position = 26° 41′ *sp*	122. 0	S
27. 0	S	Distance = 38″.090.		
27. 5	S		Mean = 120.04	
27.25	S		Z = + 0.57	
Mean = 26.41			120.61	

Mean.

Position 26° 14′ *sp*; *Distance* 38″.325; *Epoch* 1821.85.

Other measures are,

1782.82; Pos. 21° 0′ *sp*; Dist. 39″.45; H. Cat. of 1782 and MS. each being a mean of two measures in 1782 and 1783.

1819.64; Pos. 26 48 *sp*; Dist. 40″.8. Struve, Additam. 191.

M. Struve suspects a change in the angle of position, but it is rather equivocal. The angle, 21° 0′ *sp*, is a mean of 19° 30′ (the angle in the printed Catalogue) and 22° 30′, taken the following year.

No. CCXXVIII R. A. $16^h\ 15^m$; Decl. $23°\ 1'$ S.

g, 5 Ophiuchi; II. 19;

Double; pretty unequal; 8 and 9 magnitudes; north following, beyond all doubt.

June 14, 1822.
Five-feet Equatorial.
nf

Position.		Distance. Parts.	
° ′			
89.40	S	14. 3	S
89.11		11. 3	
88.42		13. 0	
89. 2		12. 8	
89.14		13. 2	
86. 7	H	12. 0	H
86.43		13. 1	
86.58		13. 2	
85.14		13. 0	
85.32		14. 5	
86. 9			
87.30		Mean = 13.04	
		Z = − 0.17	
		12.87	

Position = 87° 30′ *nf*
Distance = 4″.065

Other measures are,

1782.30; *Position* 82° 10′ *nf*; H. Catal. of 1782. The angle in the printed copy is set down as *sp*, but reference to the original observations, and the diagram made at the time, proves it indisputably to have been as here stated.

1804.45; Pos. 82° 8′ *nf*; Ditto, MS.; Distance of discs 1¼ diam. of L.

The angle has perhaps undergone a trifling change.

No. CCXXIX. R. A. $16^h\ 18^m$; Decl. $37°\ 27'$ N.

H. C. 78; STRUVE, 519;

Double; 8 and 9 magnitudes; do not bear a good illumination.

Position.	May 29, 1823.	Distance. Parts.
° ° ′	Seven-feet Equatorial.	
90—14. 7	*np*	45. 5
13.45		44. 0
14.15 } S		43. 3 } S
14. 5	Position = 76° 6′ *np*	41. 3
13.17		41. 8
Mean — 13.54	Distance = 10″.430	Mean = 43.18
		Z = + 0.20
		43.28

Position.	June 5, 1823.	Distance. Parts.
° ° ′	Seven-feet Equatorial.	
90—13.28	*np*	42. 2
14.23		42. 6
13.30 } H		43. 3 } H
12.10	Position = 76° 36′	43. 2
13.30		40. 0
Mean — 13.24	Distance = 9″.880	Mean = 42.26
		Z = − 1.17
		41.09

Mean result.

Position 76° 21′ *np*; *Distance* 10″.155; *Epoch* 1823.43.

No. CCXXX. R. A. $16^h\ 21^m$; Decl. $11^\circ\ 1'$ N.

III. 102;

7 and 11 magnitudes.

June 12, 1823.

Seven-feet Equatorial.

nf

Position.		Distance. Parts.	
° ′			
71.10	S	63. 2	S
70. 8		63. 5	
71.40		60. 7	
70.42		61. 6	
72.40		60. 5	
72.15		61. 2	
Mean = 71.26		Mean = 61.78	
		Z = − 0.09	
		61.69	

Position $= 71^\circ\ 26'$ *nf*

Distance $= 14''.833$

Sir W. Herschel's measures of this star are,

1783.64; *Position* $67^\circ\ 12'$ *nf*; *Distance* $14''.03$; Cat. of 1785.

No. CCXXXI. R. A. $16^h\ 21^m$; Decl. $18^\circ\ 47'$ N.

71 Bode, Herculis; Struve, 521; H. C. 472;

Very nearly equal; 8th magnitude; a neat close double star, and bears a very good illumination.

June 6, 1823.

Seven-feet Equatorial.

sf or *np*

Position.		Distance. Parts.	
° ° ′			
90—68.25	S	14. 0	S
70. 7		15. 0	
71. 5		15. 0	
69.45	S	13. 5	
72. 6		14. 8	
73.30		13. 6	
71.47		12. 8	H
67.50		12. 5	
71.29	H	12. 6	
71.43		13. 8	
69.40		14. 4	
71.10		14. 1	
71.44			
Mean — 70.48		Mean = 13.84	
		Z = − 0.38	
		13.46	

Position $= 19^\circ\ 12'$ *sf*

Distance $= 3''.236$

No. CCXXXII. R. A. $16^h\ 23^m$; Decl. $5°\ 51'$ N.

(*sp* 11 Serpentarii ;) II. 23 ;

Double ; 8 and 11 magnitudes.

April 9, 1823.

Five-feet Equatorial.

n p

Position.		Distance. Parts.	
° ° ′			
90—39.15	H	24. 0	H
40.20	H	27. 0	H
40.33	H	26. 8	H
38.10	H	25. 0	H
37.30	H	27. 0	H
38.10	S	24. 3	S
38.37	S	23. 9	S
38.54	S	22. 5	S
39.10	S	23. 3	S
38.16	S	23. 3	S
Mean — 38.53		Mean = 24.71	
		Z = — 0.49	
		24.22	

Position $= 51°\ 7'$ *np*

Distance $= 7''.649$

This star precedes 11 (*n*) Ophiuchi by 12′ (of space) and is 4′ to the south of it, according to the place of the latter star, brought up from BODE'S Catalogue. The right ascension and declination here set down, are those determined at the time of observation, neglecting the corrections for aberration, &c. There is no doubt therefore of its identity with the star II. 23, which is stated in the MS. Obs. of May, 1782, to be " a small star just preceding the 11th of Serpentarius," though the measures agree very ill. They may be stated as follows:

1782.38 ; Position 46° 24′ *np* ; H. Catalogue of 1782.
1802.39 ; 66 56 *np* ; H. Account of Changes, &c.
1823.27 ; 51 7 *np* ; H. and S. ut supra.

Future obsvrvations must determine which of these measures is in error, but unless two out of the three are very far from the truth, there must have been a material change in the position.

No. CCXXXIII. R. A. $16^h\ 23^m$; Decl. $8°\ 42'$ N.
H. C. 228; STRUVE, 523;
Double; large, white; small, blue; 7th and 8th magnitudes.

May 26, 1823.
Five-feet Equatorial.
nf

Position.		Distance. Parts.	
° ′			
17.40	S	189. 2	S
17.20	S	190. 5	S
17. 9	S	186. 7	S
17.35	S	188. 0	S
17.25	S	189. 2	S
Mean = 17.26		Mean = 188.72	
		Z = − 0.11	
		188.61	

Position = 17° 26′ *nf*
Distance = 59″.666

June 4, 1823.
Five-feet Equatorial.
7 and 8 magnitudes.

Position.		Distance. Parts.	
° ′			
17.25	H	189. 5	S
17.15	H	192. 0	S
17.12	H	190. 9	S
18.15	H	187. 5	S
17.40	H	189. 0	S
Mean = 17.33		Mean = 189.78	
		Z = − 1.63	
		188.15	

Position = 17° 33′ *nf*
Distance = 59″.422.

Mean result.

Position 17° 29′ *nf*; *Distance* 59″.544; *Epoch* 1823.43.

No. CCXXXIV. R. A. $16^h\ 32^m$; Decl. $4°\ 33'$ N.
36 Herculis; STRUVE, 524; V. 72;
Double; pretty unequal; large, white; small, bluish.

May 21, 1821.
Five-feet Equatorial.
sp

Position.		Distance. Parts.	
° ′			
40.35	S	217. 2	S
40. 3	S	216. 4	S
40.15	S	217. 5	S
38.44	H	219. 7	H
38.22	H	218. 1	H
39.50	H	219. 2	H
40.21	H		
38.45	H		
Mean = 39.37		Mean = 218.02	
		Z = − 0.05	
		217.97	

Position = 39° 37′ *sp*
Distance = 1′ 8″.839.

36 Herculis; STRUVE, 524; V. 72; continued.

1783.09; Position 36° 57′ *sp*; Dist. 59″.98; H. Cat. of 1785.

Another measure however taken not many days before, gave the distance 1′ 7″.77.

No. CCXXXV. R. A. $16^h 34^m$; Decl. 6° 57′ N.

STRUVE, 527; V. 127.

Pretty unequal; 7 and $8\frac{1}{2}$ magnitudes *np*.

This star, without presenting any peculiar difficulties, has presented greater discordances in its measures of distance than any yet taken. When the means differ so widely, it is needless to set down single measures, but the results of numerous sets of measures are as follows:—

1823.44; Distance by	5 measures =	51″.860	S. Five-feet Equatorial.
D°.	5	54 919	H. D°.
1823.45;	5	51 983	S. D°.
1823.46;	5	55 877	H. Seven-feet.
1823.50;	6	53 854	S. Five-feet.
1823.47;	6	56 127	H. Five-feet. The stars scarcely visible with the least illumination.
D°.	6	55 845	S, Seven-feet. These measures taken at the same time with the last, and therefore under similar disadvantages.
D°.	5	53 804	H, Seven-feet. As good measures as can be desired.
1823.54;	8	54 062	S; Sevenfeet.
1823.57;	51;	54 307;	mean.

The angles were obtained without any difficulty, and the measures were as follows;—

V. 127; STRUVE, 527; continued.

June 5. 1823.
Five-feet Equatorial.
np

Position.		Position.	
90°—68°.35′	S	90—68°.30′	H
69. 5	S	69.28	H
68.40	S	69.15	H
69.20	S	69. 5	H
69.10	S	68.48	H
Mean — 68.58		Mean = 69. 1	

Angle = $\begin{cases} 20° \;\; 2' \; np. \text{ S} \\ 20 \;\; 59 \; np. \text{ H} \end{cases}$

The mean result may therefore be stated with some confidence as follows:—

1823.5; Position 21° 01′ *np*; Distance 54″.307.

Sir WILLIAM HERSCHEL's measures are

1783.66; Position 19°45′ *np*; Distance 48″.667; H. Cat. of 1785.

No. CCXXXVI. R. A. 16h 32m; Decl. 53° 17′ N.

17 Draconis; I. 4; STRUVE, 525.

Triple; A of the 3d; B of the 6½; C of the 5th magnitude.

April 10, 1823.
Five-feet Equatorial.
Measures of A B
sf

Position.		Distance. Parts	
90°—66°.35′	H	15. 2	H
66.20	H	16. 0	H
63.50	H	15. 1	H
65.30	H	14. 9	H
64.10	H	15. 0	H
Mean — 65.17		Mean = 15.24	
		Z = — 0.73	
		14.51	

Position 24° 43′ *sf*
Distance = 4″.583.

Measures of AC.
sp

Position.		Distance. Parts.	
73°.30′	H	286. 5	H
74.29	H	286. 3	H
73.15	H	288. 3	H
74.12	H	286. 9	H
73.50	H	285. 5	H
Mean = 73.51		Mean = 286.70	
		Z = — 0.73	
		285.97	

Position = 73° 51′ *sp*
Distance = 1′ 30″.315

17 Draconis continued.

May 21, 1823.

Five-feet Equatorial.

Measures of AB.

sf

Position.		Distance. Parts.	
90°—63°.18′	H	14. 8	S
64.12	H	14. 3	S
63.40	H	15. 1	S
63.42	H	14. 8	S
64.18	H	14. 5	S
		15. 2	S
Mean —63.50		Mean = 14.78	
		Z = — 0.72	
		14.06	

Position = 26° 10′ *sf*
Distance = 4″.441

Measures of AC.

sp

Position.		Distance Parts.	
74°.10′	S	286. 0	S
74.41	S	287. 0	S
75. 0	S	286. 2	S
74.20	S	286. 3	S
74.10	S	286. 7	S
Mean 74.28		Mean = 286.44	
		Z = — 0.72	
		285.72	

Position = 74°28′ *sp*
Distance = 1′.30″.236.

Mean. Position of AB 25° 26′ *sf*; Distance 4″.512 } 1823.33.
AC 74 10 *sp*; 1′.30 275 }

Other measures are

1781.88; Position 24° 0′ *sf*; H. Catalogue of 1782. Dist. 1½ diameter.
1802.83; 27 41 *sf*; D°. M.S.
1814.19; 27 ± *sf*; STRUVE, Catalogus Secundus; Dorp. Obs. ii. p. 50.
1819.63; 26 10 *sf*; Distance 4″.19; D°. Additamenta, 191.

This star therefore seems to have undergone no change.

No. CCXXXVII. R. A. $16^h\ 35^m$; Decl. 31° 56′ N.

ζ Herculis; I. 36; Struve, 529.

April 27, 1821.

Decidedly single, with powers 133 and 303. The evening exceedingly favourable, and the star perfectly round and well defined.

June 19, 1822.

Perfectly round with 133. Not separated with 381. The evening beautiful.

Single; perfectly round with a magnifying power of 381.

The evening beautifully fine, S. σ Coronæ was seen double the same night (May 1, 1823).

October 17, 1823.

This star was examined with a single eye lens, adapted to the five feet equatorial, magnifying 578 times, but not the least appearance of elongation could be perceived. The night was fine, but the star four hours from the meridian.

No. CCXXXVIII. R. A. $16^h\ 35^m$; Decl. 24° 0′ N.

H. C. 369; Struve, 530;

Nearly equal; 9th and 9½ magnitudes; bear very little illumination.

Position. ° ° ′	May 29, 1823.	Distance. Parts.
90—68.30	Seven-feet Equatorial.	30. 0
68. 5		28. 8
68.11 } S	*np*	29. 2 } S
67.12		27. 8
67.50		27 7
Mean — 67.58	Position = 22° 2′ *n p*	Mean — 28.70
	Distance = 6″.948	Z = + 0.20
		28.90

H.C. 369; STRUVE, 530; continued.

June 16, 1823.

Seven-feet Equatorial.

Equal; each of 9th magnitude.

np or *sf*

Position.		Distance. Parts.	
° '			
90—70.40	H	24. 4	H
70.12	H	29. 0	H
68 25	H	28. 8	H
66.50	H	26. 0	H
69.30	H	27. 3	H
		28. 3	H
Mean — 69. 7		Mean — 27.30	
		Z = — 0.01	
		27.29	

Position $= 20° 53'$ *np*
Distance $= 6''.562$

Mean result.

Position 21° 27′ *np*; *Distance* 6″.755; *Epoch* 1823.43.

No. CCXXXIX. R. A. $16^h 37^m$; Decl. 8° 55′ N.

43 Herculis;

Double very unequal; large, decidedly red; small, bluish

May 21, 1821.

Five-feet Equatorial.

s p

Position.	
° '	
39. 0	H
39.30	H
40. 3	H
41.31	S
40.30	S
40.20	S
Mean = 40. 9	

Position $= 40° 9.'$ *s p*
Distance $= 1'.20''.518$, single measure.

June 15, 1821.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° '			
38.10	S	252. 8	S
38.15	S	254. 0	S
38.27	S	253. 2	H
37.32	H	253. 0	H
38.12	H	254. 0	H
38.19	H	253. 0	S
Mean 38. 9		Mean = 253.33	
		Z = + 0.05	
		253.38	

Position $= 38° 9'$ *sp*
Distance $= 1'.20''.023$

Mean.

Position 39° 9′ *sp*; *Distance* 1′.20″.094; 1821.42.

43 Herculis continued.

M. Struve has measured this star, rightly remarking that the star III. 41, which in the catalogue of 1782 is called 43 Herculis, must be another star. In fact it is 100 Herculis, which both Mayer and Piazzi have also observed to be double. M. Struve's measures of 43 are

1819.63. *Position* 39° 42′ *sp* ; *Distance* 1′23″.7.

No. CCXL. R. A. 16^h 46′; Decl. 19° 15′ S.

Piazzi, XVI. 236; Struve, 534;

Large, white; small, blue; 6 and 8 magnitudes.

June 10, 1823.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.
42.15		20. 8
45.40		19. 5
41.40		19. 6
40. 0	S	18. 8
43.54		18. 3
43.30		20. 5
40.20		
44.30		
Mean 42.44		Mean = 19.58
		Z = − 1.72
		17.86

Position = 42° 44′ *sp*
Distance = 5″.641

No. CCXLI. R. A. 16^h 53^m; Decl. 47° 36′ N.

H. C. 510; Struve, 536;

Very nearly equal; $7\frac{1}{2}$ and $7\frac{3}{4}$ magnitudes.

May 26, 1823.

Five-feet Equatorial.

sp

Position. ° ′		Distance. Parts.
6.40		370. 5
6.40		366. 3
6. 0	S	367. 3
6. 6		367. 0
6.10		366. 5
Mean 6.19		Mean = 367.52
		Z = − 0.11
		367.41

Position = 6° 19′ *sp*
Distance = 1′.56″.036.

H. C. 510, STRUVE, 536; continued.

June 4, 1823.

Five-feet Equatorial.

Very nearly equal. H.

nf?

Position.	Distance. Parts.
° ′	
5.33	365. 5
6.42	363. 6
6.31	365. 7
6.20	369. 0
5.55	366. 7
	367. 0
Mean 6.12 (H)	Mean = 366.25 (H)
	Z = − 1.63
	364.62

Position = 6° 12′ *nf* or *sp*

Distance = 1′.55″.154

June 5, 1823.

Seven-feet Equatorial.

sp

Position.	Distance. Parts.
° ′	
4.55	475. 0
5.30	480. 0
6. 0	476. 0
6. 5	482. 0
5.40	485. 0
	474. 0
Mean = 5.38 (H)	Mean 478.67 (H)
	Z = − 1.17
	477.50

Position = 5° 38′ *sp*

Distance = 1′.54″.811.

June 29, 1823.

Seven-feet Equatorial.

sp

Distance Parts.
477. 0
476. 0
478. 5
480. 3
475. 5
477. 0
Mean = 477.38 (S)
Z = − 1.16
476.22

Distance = 1′.54″.504

Mean result.

Position 6° 3 *np*; *Distance* 1′.55″.126; *Epoch* 1823.44.

No. CCXLII. R. A. $17^h\ 3^m$; Decl. $54^\circ\ 43'$ N.

21. μ Draconis; II. 13; STRUVE, 539.

Double; equal.

May 18, 1821.

Five-feet Equatorial.

sp or *nf*

Position.		Distance. Parts.	
° '			
61.55	H	15. 0	H
61. 3	H	14. 0	H
62.12	H	15. 1	H
61.45	S	14. 0	H
61.55	S	12. 0	S
61. 3	S	13. 0	S
		12. 0	S
		13. 1	S
		13. 3	S
		13. 2	S
Mean 61.39		Mean 13.47	
		Z = − 1.10	
		12.37	

Position $= 61^\circ.39'$ *sp* or *nf*

Distance $= 3''.907$

The measures of this star arranged in order of time, are

1781.73; Position 37° 38′ *sp* or *nf*; Distance 4″.354; H. Catal. of 1782.

1802.17;	50 32 *sp* or *nf*;	D°. Account of Changes, &c. Mean of the three 1803.45; Pos. 49° 52′ *sp*
1804.09;	49 0 *sp*;	
1804.10;	54 4 *sp*;	
1819.74;	60 0 *sp*; Distance 4″.190; STRUVE, Additam. p. 191.	
1821.38;	61 39 *sp* or *nf*; H and S. ut supra.	
1821.80;	59 12 *sp*; Δ decl. = 4″.005 (6 measures; whence we compute distance = 4″.619) STRUVE) Dorp. Obser. iii. ZACH viii. 525.	

Or, grouping together observations made about the same epoch,

1781.73; Position 37°.63 } 12°.23 in 21,72 years, or 0°.5631 per annum.
1803.45; 49.86 } 10°.43 in 17.52 years, or 0°.5953 per annum.
1820.97; 60.29

No doubt therefore can remain of the reality of an angular motion in this star, as announced by Sir WILLIAM HERSCHEL

21, μ Draconis continued.

in 1804; and the observations here brought together prove it to have been hitherto nearly uniform, and averaging 0°.5792 per annum, in the direction *npsf* or retrograde. There can be little doubt of its being a binary system—a miniature of α Geminorum.

No. CCXLIII. R. A. $17^h\ 4^m$: Decl. 26° 18 S.

36 Ophiuchi;

Double; nearly equal; 6th magnitude.

June 13, 1822.

Five-feet Equatorial.

sp or *nf*

Position.	
° ′	
43.24	H
41. 8	H
40.56	H
42.20	H
42.30	H
Mean = 42. 4	

Position = 42° 4′ *sp* or *nf*

The stars appear to describe angles of 10 or 12 degrees about each other, from the effect of refraction twinkle very much, and the measures are in consequence very difficult.

June 19, 1822.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
° ′			
43.35	S	20. 0	S
44. 9	S	19. 4	S
43.26	S	20. 0	S
42.50	S	18. 8	S
43. 0	S	18. 1	S
42.13	S	20. 3	S
42.34	S	19. 3	S
Mean = 43. 7		Mean = 19.41	
		Z = − 1.48	
		17.93	

Position = 43°.7′ *sp*

Distance = 5″.662.

Stars very steady; the measures very satisfactory.

36 Ophiuchi continued.

April 10, 1823.
Five-feet Equatorial.
nf

Position $= 42^\circ 45'$ *nf*, single measure.
Distance $= 5''.385$.

	Distance. Parts.	
	16. 9	H
	19. 0	
	16. 2	
	18. 8	
	18. 0	
Mean =	17.78	
Z = −	0.73	
	17.05	

Measures of a distant star,

10th magnitude, *np*.

Angle $= 19^\circ 5'$ *np*; Distance $= 3' 0''.735$, single measures.

Mean.

Position $42^\circ 41'$ *sp* or *nf*; *Distance* $5''.546$; 1822.52.

The small star observed on the 10th April will serve to verify the proper motion of A (36), which has been supposed in some way connected with the star 30 Scorpii, though at a great distance (12′) from it, by reason of an observation of Bessel, that they have a common proper motion. The point is a very interesting one, especially should other stars in this neighbourhood appear to be similarly affected. But our knowledge of the proper motions of the stars is lamentably deficient—or rather our ignorance respecting them is the opprobrium of modern astronomy.

No. CCXLIV. R. A. $17^h\ 6^m$; Decl. $14^\circ\ 36'$ N.

α Herculis; STRUVE, 540; II. 2;

April 27, 1821.

Five-feet Equatorial.

sf

Position.		Distance. Parts.	
° ° ′			
90—59.20	S	16. 5	S
60.40		16. 0	
61.38		16. 0	
61.40		15. 9	
61.22		17. 0	
61.32		17. 4	
Mean — 61. 2		Mean = 16.47	
		Z = — 0.11	
		16.36	

Position = 28° 58′ *sf*

Distance = 5″.167.

Measures taken by daylight.

May 15, 1821.

Large, ruddy; small, green.

Five feet Equatorial.

sf

Position.		Distance. Parts.	
° ° ′			
90—60.50	H	16. 0	H
59.17		17. 5	
60.10		15. 2	
61. 0		16. 0	
62. 1		16. 2	
60.34		16. 4	
59.26			
Mean — 60.28		Mean = 16.22	
		Z = — 0.05	
		16.17	

Position = 29° 32′ *sf*

Distance = 5″.107.

July 14, 1822.

Seven-feet Equatorial.

sf

Position.		Distance. Parts.	
° ° ′			
90—62.22	S	23. 3	S
61.20		24. 5	
57.35		24. 5	
58.10		23. 2	
61.30			
62.29			
62.16			
58.11			
59.31			
57.31			
Mean — 60. 6		Mean = 23.87	
		Z = — 0.74	
		23.13	

Position = 29° 54′ *sf*

Distance = 5″.561

Stars very unsteady and ill defined.

Mean.

Position 29° 33′ *sf*; *Distance* 5″.286; 1821.74.

α Herculis continued.

Other measures are,

	Position.	Distance.	
1781.03;	———	5″.046.	H. mean of 9 measures (MS.) from 1779 to 1782.
1782.69;	27° 10′ *sf*;		H. mean of 4 measures (MS.) in 1781 and 1783.
1803.40;	31 57 *sf*;		Ditto, by 8 measures in 1802, 3, 4.
1819.60;	26 36 *sf*;	5 .61.	STRUVE, Additamenta, 192. M. STRUVE considers the angle as certain to within one degree. If our observations however be correct, it must be nearly 3° in error. The mean of all the observations in Sir W. H's MSS. is 30° 21′, differing but 48′ from ours.

	Position.	Distance.	
1821.66;	25° 45′ *sf*;		STRUVE. Vide ZACH, Corr. Astr. viii. 524.
1822.66;	———	5″.130.	Ditto. Vide ZACH, viii. p. 369, also Astr. Nachr. No. 22.
1823.;	———	4 .600.	AMICI, Vide ZACH, Corr. Astr. viii. p. 216.

The cause of the continued disagreement between our measures of the position of this beautiful star and M. STRUVE's remains to be enquired into. M. AMICI's measure of the distance, it can hardly be doubted, is too small.

No. CCXLV. R. A. 17ʰ 7ᵐ; Decl. 24° 5′ S.

39, *o* Ophiuchi; III. 25;

Pretty unequal; large, red; small, blue; 7 and 8 magnitudes.

May 28, 1822.
Five-feet Equatorial.
np

Position. ° ° ′		Distance. Parts.	
90—4.10	H	39. 1	H
4.24	H	40. 0	H
4. 8	H	40. 5	H
3.30	H	39. 3	H
4. 0	S	40. 0	H
4.30	S	37. 0	S
4.25	S	38. 0	S
4.40	S	37. 3	S
		39. 2	S
		40. 1	S
Mean — 4.13		Mean = 39.05	
		Z + 0.57	
		39.62	

Position = 85°.47′ *np*
Distance = 12″.512.

Sir W. HERSCHEL's measures are,

1782.46; *Position* 87° 14′ *np*; *Distance* 10″.367; H. 1782.

CCXLVI. R. A. $17^h\ 8^m$; Decl. $25°\ 3'$ N.

δ Herculis; STRUVE, 541; V. 1;

Extremely unequal.

May 15, 1821.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
$90°-8°.0'$	H	89. 5	H
8.42	H	90. 0	H
7.30	H	92. 0	H
7. 0	H	90. 3	H
7. 4	S	91. 5	S
7.44	S	91. 1	S
8.23	S	92. 8	S
8.20	S	92. 9	S
		93. 0	S
Mean = 7.50		Mean = 91.46	
		Z = − 0.05	
		91.41	

Position = $82°\ 10'$ *sf*
Distance = $28''.869$

Other measures of this star are,

1781.81; Pos. $72°\ 28'$ *sf*; Dist. $34''.218$. H. Cat. of 1782. The distance is the mean of that in the printed Catalogue and another MSS. measure $34''.687$.

1819.62; 84 18 *sf*; STRUVE, Dorp. Obs. ii. p. 164. Obs. 50.

1821.92; Δ declin. = $27''.885$ (whence distance = 28.148.) STRUVE. Vide ZACH viii. p. 526; mean of 2 meas.

There can be no doubt of a material change both in position and distance having taken place in this star, $+ 9°\ 42'$ in the one, and $- 5''.349$ in the other, are quantities too large to leave any room for doubt. The proper motion of δ, if correctly stated in PIAZZI'S Catalogue, should have carried it in 40 years $- 8''$ in R. A. and $- 5''.6$ in declination, in the direction *sp*, at an angle of 37° with the parallel. Had the small star then remained at rest, the angle of position, instead of 82°, would now have been only 54° *sf*, and the distance $32''.3$.

No. CXLVII. R. A. $17^h\ 11^m$; Decl. 12° 39′ S.
ν Serpent. Ophiuchi; STRUVE, 542; V. 29;
Double; excessively unequal; large, reddish white: small, lilac.

June 13, 1821.
Five-feet Equatorial.
nf

Position. ° ′		Distance. Parts.	
58.35	H	155. 0	
58.13	H	160. 0	
58. 0	H	162. 0	
		160. 5	
Mean = 58.16		Mean = 159.37	
		Z = + 0.81	
		160.18	

Position = 58° 16′ *nf*
Distance = 50″.588

June 21, 1822.
Five-feet Equatorial.
nf

Position. ° ′		Distance. Parts.	
58.30	S	158. 5	S
59.30	S	160. 5	S
59.24	S	161. 2	S
60.18	S	158. 3	S
60. 0	S	159. 4	S
60.28	S	160. 2	S
Mean = 59.42		Mean = 159.68	
		Z = − 1.48	
		158.20	

Position = 59° 42′ *nf*
Distance = 49″.963

Mean.
Position 59° 13′ *nf*; *Distance* 50″.213; 1821.97.

No. CCXLVIII. R. A. $17^h\ 17^m$; Decl. 37° 19′ N.
ρ Herculis; STRUVE, 545; II. 3;
Double; rather unequal.

May 18, 1821.
Five-feet Equatorial.
np

Position. ° ° ′		Distance. Parts.	
90—52.30	H	17. 5	H
52.30	H	17. 9	H
52.45	H	17. 4	H
51.28	H	16. 8	H
52.35	S	13. 5	S
52. 4	S	13. 2	S
51.42	S	15. 5	S
51.23	S	15. 2	S
		15. 0	S
Mean — 52. 7		Mean = 15.77	
		Z = − 1.10	
		14.67	

Position = 37° 53′ *np*
Distance = 4″.463.

ρ Herculis continued.

The measures of this star arranged in order of time, are

1781.79;	Position 30° 21′ *np*;	Distance 2″.969;	H. Catal. of 1782.
1802.17;	31 12		H. (MSS.)
1919.63;	36 9 *np*;	4″. 78;	Struve, Additamenta, p. 192.
1821.38;	37 53 *np*;	4″.463;	H and S. ut supra.
1821.76;	35 54 *np*;	;	Struve, Dorp. Obser. iii. vide Zach, viii. 524.
1822.65;		4″. 38;	D°. Astronomische Nachrichten, No. 22.

It seems extremely probable that this elegant double star has undergone a sensible alteration in its position. The distance has increased materially.

CCXLIX. R. A. 17h 26m; Decl. 9° 43′ N.

53 Ophiuchi; Struve, 547; V. 30;

Double; both blue, or bluish white; very unequal.

June 14, 1821.
Five-feet Equatorial.
sp

Position. ° ′		Distance. Parts.	
78.15	H	130. 5	H
79.17	H	131. 0	H
78.47	H	131. 8	H
78.40	S	131. 9	S
78.20	S	133. 0	S
78.50	S	133. 0	S
Mean — 78.41		Mean = 131.87	
		Z = + 0.05	
		131.92	

Position = 78° 41′ *sp*
Distance = 41″.662.

1782.38; Position 77° 12′ *sp*; Distance 32″.35; H. Cat. of 1782; and MS.

The distance is said to be a narrow measure.

CCL. R. A. $17^h 29^m$; Decl. $55^\circ 19'$ N.

ν Draconis; STRUVE, 549; V. 11.

Double; equal; both stars bluish white.

June 13, 1821.

Five-feet Equatorial.

np or *sf*

Position.		Distance Parts.	
$90^\circ - 46^\circ.16'$	H	196. 0	H
47.13		194. 2	
48. 0		196. 2	
46.52		195. 8	
47.27		194. 2	
Mean — 47.10		Mean = 195.28	
		Z = + 0.81	
		196.09	

Position = $42^\circ 50'$ *np* or *sf*

Distance = $1' 1''.929$.

June 5, 1823.

Equal; each of the 4th magnitude.

Five-feet Equatorial.

sf or *np*

Position.		Distance. Parts.	
$90^\circ - 48^\circ.30'$	S	199. 5	S
48.40		200. 0	
47.55		199. 2	
47.35		198. 3	
47.47		200. 0	
47.35		198. 7	
48.20			
Mean — 48. 3		199.28	
		Z = − 1.21	
		198.07	

Position = $41^\circ.57'$ *sf* or *np*

Distance = $1'.2''.555$.

The stars four hours east of the meridian admirably defined, and the measures taken by twilight without artificial illumination.

Mean.

Position $42^\circ 23'$ *np* or *sf*; *Distance* $1' 2''.242$; 1822.44.

ν Draconis continued.

Other measures are,

1781.83.	Position 44° 19′ *np*;	Distance 54″.80;	H. Catal. of 1782.
1800.	44 12 *np*;	1′ 1″.41;	PIAZZI, according to M. STRUVE.
1815.	40 48 *np*;	1′ 0″.45;	STRUVE, Dorp. Obs. i. Catalogus 1. No. 152.
1819.60.	41 9 *sf*;		
1821.78.	41 48 *np*;	1′ 4″.559;	STRUVE, (from Δ decl. = 43″.03) ZACH, viii. 525.

No. CCLI. R. A. $17^h\ 30^m$; Decl. 2° 8′ N.

(254 Bode Ophiuchi); STRUVE, 550; H. C. 541.

Double; pretty unequal; 6 and 7½ magnitudes.

June 10, 1823.

Five-feet Equatorial.

np

Position = 59°.0′ *np*

Distance = 1′.51″.543.

Position. ° ° ′		Distance. Parts.	
90—31. 0	S	354. 3	S
31.30		356. 2	
30.40		354. 7	
30.50		353. 7	
30.45		356. 5	
31.15		354. 0	
Mean — 31. 0		Mean = 354.90	
		Z = — 1. 72	
		353. 18	

June 12, 1823.

Seven-feet Equatorial.

Triple; A = 5th magnitude; B = 6th; C = 12th magnitude.

Measures of A. B.

np

Position = 57° 26′ *np*

Distance = 1′.50″.818.

Position. ° ° ′		Distance. Parts.	
90—32.35	H	462. 5	H
31.50		463. 2	
32.45		461. 1	
33.30		460. 5	
32.12		457. 6	
Mean — 32.34		Mean = 460.98	
		Z = — 0.09	
		460 89	

(254 BODE Ophiuchi); STRUVE, 550; H. C. 541 continued.

Measures of A. C. — Measures of B. C.

n f Position.

Position.		Seven-feet Equatorial.	Position.	
° ′			° ′	
67.35	H	Position of A. C. = 68° 37′ *nf*	17.20	H
69.30			16.45	
67.32		Position of B. C. = 17″.23 *nf*	16.38	
69.20			18. 0	
68.55			18.12	
68.50				
Mean = 68 37			17.23	

Mean result.

A. B.;	*Position* 58° 7′ *np*;	*Distance* = 1′.51″.213;	1823.42.
A. C.;	68 37 *nf*;	2 18 09	
B. C.;	17 23 *nf*;	1 54 31	

The distances A. C. and B. C. are computed trigonometrically from the three angles, and the side A. B. of the triangle formed by the stars.

No. CCLII. R. A. $17^h\ 36^m$; Decl. 2° 41′ N.

61 Ophuichi; IV. 32; STRUVE, 552.

Double; slightly unequal.

Position.

° ° ′	
90—87.30	H
86.19	
87.14	
Mean — 87. 1	

May 18, 1821.
Five-feet Equatorial.
sf

Position = 2° 59′ *sf*

Position.

° ° ′	
90—85.50	H
87. 8	
87. 0	
Mean — 86 39	

June 14, 1821.
Five-feet Equatorial.
sf

Position = 3° 21′ *sf*

61 Ophiuchi; STRUVE, 552; IV. 32, continued.

June 21, 1822.
Five-feet Equatorial.
sf

Position.	Distance. Parts.
90° — 86°.16′	66. 3
85.35	67. 5
85.54	66. 9
86.13	66. 3
86. 6	68. 2
86.10	67. 7
86.30	67. 9
86.25	68. 1
S	S
Mean — 86. 9	Mean = 67.36
	Z = — 1.48
	65.88

Position = 3°.51′ *sf*
Distance = 20″.806.

July 6, 1823.
Seven-feet Equatorial.
sf

Distance. Parts.
85. 7
83. 2
85. 2
87. 4
86. 7
84. 3
83. 0
84. 5
S
Mean = 85.00
Z = — 0.84
84.16

Distance = 20″.235

Mean result.

Position 3° 33′ *sf*; *Distance* 20″.520; *Epoch* 1821.77.

The measures of this star in order of time, are

1781.55;	Position 0° 0′ *f*;	Distance 19″.07;	H. Cat. of 1782.
1819.65;	4 3 *sf*;	20 44;	STRUVE, Additamenta. &c. 192.
1821.77;	3 33 *sf*;	20 520;	H. and S. Mean result, ut supra.
1822,60;		20 170;	STRUVE, Astronom. Nachrichten, N°. 22.

The position of 1781 is a mere estimation, "almost exactly following," but it is sufficient to show that no material alteration of position has taken place.

No. CCLIII. R. A. $17^h 36^m$; Decl. 13° 14′ S.

H. C. 348; STRUVE, 553.

Very nearly equal; $7\frac{1}{2}$ and $7\frac{3}{4}$ magnitudes.

June 11, 1823.
Seven-feet Equatorial.
sp

Position.		Distance. Parts.	
° ′			
69. 3	S	69. 0	S
68.10	S	64. 0	S
69. 7	S	65. 5	S
68.40	S	66. 0	S
68.30	S	66. 5	S
		68. 0	S
Mean = 68.42		Mean 66.50	
		Z = − 0.29	
		66.21	

Position = 68° 42′ *sp*
Distance = 15″.919

June 12, 1823.
Five-feet Equatorial.
sp

Position.	
° ′	
66.30	S
66.50	S
66. 5	S
65.40	S
66.40	S
Mean = 66.21	

Position = 66° 21′ *sp*

June 12, 1823.
Seven-feet Equatorial.

Very nearly equal; 8th magnitude.
nf or *sp*

Position.		Distance. Parts.	
° ′			
65. 7	H	65. 0	H
65.15	H	61. 4	H
65. 7	H	70. 5	H
65.45	H	66. 5	H
65.35	H	66. 7	H
Mean — 65.21		Mean = 66.02	
		Z = − 0.09	
		65.93	

Position = 65° 21′ *nf* or *sp*
Distance = 15″.852

H. C. 348; STRUVE, 553, continued.

Position.	
° ′	June 29, 1823.
54. 0 } S	Five-feet Equatorial.
50. 5	
50. 7	
49. 5	
51. 3	
51. 2	Distance = 15″.836.
Mean = 51.20	
Z = − 1.06	
50.14	

Night exceedingly favorable for measures of southern stars; they pass through the field as steadily as if in the zenith. S.

Mean result.

Position 66° 48′ *sp*. *Distance* 15″.869; 1823.46.

No. CCLIV. R. A. $17^h\,45^m$; Decl. 72° 14′ N.

ψ Draconis; IV. 7; STRUVE, 555.

Double; unequal; both white.

Position.		Distance. Parts.
° ′	June 15, 1821.	98. 2 } H
75. 2 } H	Five-feet Equatorial.	99. 3
74. 8	*nf*	101. 0
75.10		101. 0 } S
76.16 } S		101. 2
75.10		102. 5
75.38	Position = 75°.14′ *nf*	102. 0
Mean = 75.14	Distance = 31″.777.	99. 4 H
		Mean = 100.57
		Z = + 0.05
		100.62

Stars beautifully defined.

Other measures are

1781.69; Distance = 28″.233; H. Catal. of 1782.

1815.19; Δ R A = 1s.64 in time; STRUVE, Catalogus i. Stella 158; whence taking 75° for the position, the distance = 29″.450.

No. CCLV. R. A. 17^h 52^m; Decl. 2° 57′ N.

67 Ophiuchi; VI. 2; Struve, 557;

Double; 5th or 6th and 9th magnitudes.

April 11, 1823.
Five-feet Equatorial.
sf

Position. ° ° ′	
50—37.10	S
36.30	S
37.28	S
37.30	S
37. 0	S
36.55	H
36.47	H
36.28	H
36.43	H
36.48	H
Mean — 36.56	

Position = 53° 4′ *sf*
Distance = 55″.231

Distance. Parts.	
171. 3	S
174. 2	S
172. 5	S
173. 7	S
176. 8	S
181. 0	H
175. 5	H
178. 2	H
178. 0	H
182. 0	H
177. 0	H
175. 0	S
Mean = 176.26	
Z = — 1.38	
174.88	

July 15, 1823.
Seven-feet equatorial.
Large, yellowish white; small, blue.

Distance. Parts.	
228. 8	S
232. 7	S
231. 8	S
231. 2	S
230. 8	S
229. 0	S
230. 7	S
Mean = 230.71	
Z = — 1.03	
229.68	

Distance = 55″.225

Small star does not bear a good illumination. S.

1781.64; Distance 50″. 6; single measure. H. MS.
1823.41; Position 53° 4′ *sf*; distance 55″.228; H. and S. ut supra. Mean result.
1819.65; 53 15 *sf*; Struve; Dorpat Obs. ii. Observations 30 and 107.

No. CCLVI. R. A. $17^h\ 52^m$; Decl. $30°\ 5'$ N.

H. C. 168; STRUVE, 558;

Large, white; small, blue; 6 and 8 magnitudes.

June 10, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
° ° ′			
90—80.45	S	64. 8	S
82. 0		68. 5	
81.45		67. 7	
81.45		66. 2	
80.50		66. 8	
82. 5		66. 4	
Mean — 81.32		Mean = 66.73	
		Z = − 1.72	
		65.01	

Position = 8° 28′ *np*
Distance = 20″.531.

June 12, 1823.
Seven-feet Equatorial.
np

Position.		Distance. Parts.	
° ° ′			
90—79.50	H	83. 5	H
80. 5		83. 0	
81. 0		83. 3	
81.30		84. 5	
80.45		82. 0	
Mean — 80.38		Mean = 83.26	
		Z = − 0.09	
		83.17	

Position = 9° 22′ *np*
Distance = 19″.998.

June 29, 1823.
Seven-feet Equatorial.

Position.	
° ′	
83. 7	S
85. 7	
81. 5	
87. 2	
84. 8	
83. 5	
Mean = 84.40	
Z = − 1.16	
83.24	

Distance = 20″.015

Mean result.

Position 8° 53′ *np* ; *Distance* 20″.181 ; 1823.45.

No. CCLVII. R. A. 17^h 54^m; Decl. 21° 36′ N.

95 Herculis; STRUVE, 561; III. 26;

Double; very nearly if not quite equal; the preceding star reddish, the following bluish white.

June 13, 1821.
Five-feet Equatorial.
nf

Position.	Distance. Parts.
° ′	
8.40	19. 5
8.15	18. 8
8.42 H	21. 0 H
7.32	20. 7
8.27	20. 0
Mean = 8.21	Mean = 20. 0
	Z = + 0.81
	20.81

Position = 8° 21′ *nf*
Distance = 6″.572

June 22, 1822.
Five-feet Equatorial.
nf if unequal.

Position.	Distance. Parts.
° ′	
7.58	22. 7
7.42	22. 8
7.40	22. 0
8.15 S	22. 5
8.17	22. 2
8. 6	23. 0 S
8.18	22. 5
7. 3	23. 0
	21. 9
	22. 9
	22. 6
	22. 3
Mean = 7.55	Mean = 22.53
	Z = − 1.48
	21.05

Position = 7° 55′ *nf*
Distance = 6″.648.

Mean.

Position 8° 8′ *nf*; *Distance* 6″.623; *Epoch* 1821.97.

1781.81;	Position 4° 9′ *sp*;	Distance 6″. 1;	H. Cat. of 1782.
1802.31;	7 21 *sp*;		H. (MSS.)
1819.63;	9 33 *sp*;	7 .04;	STRUVE, Additamenta, &c. p. 193.
1822.68;	———	6 .54;	Ditto ZACH, Corr. Astr. viii. 369.

No. CCLVIII. R. A. 17° 56′; Decl. 2° 33′ N.

70 *p* Ophiuchi; II. 4; Struve, 562;

Considerably unequal; large, white; small, livid.

April 18, 1821. Five-feet Equatorial. *sf*

Position.	
66°.55′	H
68.20	H
65.33	H
65.30	H
66.37	H
65.35	S
65. 1	S
Mean = 66.13	

Position = 66° 13′ *sf*

These observations taken when the star was 1^h 40^m from the meridian.

April 27, 1821. Five-feet Equatorial. *sf*

Position.		Distance. Parts.	
90°—23°.52′	S	11. 0	S
24.55	S	11. 9	S
24.50	S	11. 5	S
25.30	S	11. 5	S
25.33	S	11. 8	S
25.20	S	12. 0	S
23.17	H	10. 0	H
22.53	H	12. 0	H
22.39	H	12. 5	H
22. 0	H	11. 5	H
		13. 0	H
		12. 6	H
Mean — 24. 5		Mean = 11.77	
		Z = — 0.11	
		11.66	

Position = 65° 55′ *sf*

Distance = 3″.682.

May 28, 1822. Five-feet Equatorial. *sf*

Position.		Distance. Parts.	
90°—26°.30′	H	14. 8	S
24. 1	H	15. 0	S
24.45	H	15. 9	S
24. 5	H	16. 0	S
23.15	H	14. 3	S
24.14	H	15. 5	S
24.25	S	14. 0	H
24.18	S	13. 8	H
24.27	S	15. 0	H
24.30	S	13. 4	H
23.50	S	15. 3	H
23.58	S	14. 5	H
Mean — 24.21		Mean = 14.79	
		Z = + 0.57	
		15.36	

Position = 65° 39′ *sf*

Distance = 4″.851

Stars beautifully defined, and each sharply bisected in the measures of distance.

70 *p* Ophiuchi continued.

Position.

°	° ′	
90—	25.27	S
	23.57	S
	24.25	S
	27.15	S
	27.12	S
	27.30	S
Mean —	25.28	

August 16, 1822.

Five-feet Equatorial.

sf

Position = 64° 2′ *sf*

April 9, 1823.

Five-feet Equatorial.

sf

Position.

°	° ′	
90—	27.47	H
	27.31	H
	26. 5	H
	28.15	H
	25.30	H
	26.28	H
	25.40	S
	26.45	S
	27.16	S
	26.25	S
	26.43	S
	28.30	S
Mean —	26.55	

Position = 63° 5′ *sf* very satisfactory.

June 4, 1823.

Five-feet Equatorial.

7 and 8 magnitudes.

sf

Position.

°	° ′	
90—	26.35	H
	25.47	H
	26. 0	H
	25.13	H
	25.28	H
(*a*)	27. 0	H
(*b*)	25.17	H
Mean —	25.54	

Position = 64° 6′ *sf*

N. B. A smoked light-green glass used to take off the flare.

(*a*) Set to —28° 30′ wrong. Corrected to 27° 0′ as above.

(*b*) Set to — 22° 30′ very bad. Corrected to 25° 17′.

Mean result.

Position 64° 48′ *sf*; *Distance* 4″.266; *Epoch* 1822.42.

70 *p* Ophiuchi continued.

The various measures of this star by different observers, may be arranged in order of time as follows:

1779.77;	Position	0° 0′ *f*;	H. Account of Changes, &c. 1804.
* 1781.74;		9 14 *sf*;	Distance 4″.492; D°, the distance a mean of 4. MS.
1802.34;		66 8 *np*;	Ditto. MS.
1804.42;		48 48 *np*;	Ditto, mean of 2 meas. May 29 and June 3. MS.
1819.63;		78 42 *sf*;	Distance 4″.559; STRUVE, Additamenta, 179. The distance computed from Δ R.A. = 0ˢ.061. Two measures with a projection micrometer gave 5″.34.
1820.23;		72 6 *sf*;	Ditto, ZACH, Corr. Astr. viii. p. 521; 3 measures.
1821.31;		66 2 *sf*;	H. and S. Mean of the meas. of 1821, ut supra.
1821.72;		67 39 *sf*;	STRUVE, vide ZACH Corr. Ast. viii. 520; Distance = 4″.303, D°. D°. computed from the angle 67° 39′, and 12 measures of Δ declination.
1822.42;		64 48 *sf*;	H. and S, computed mean of 3 years observations.
1822.49;		65 7 *sf*;	H. and S, mean of observations of 1822.
1823.32;		63 25 *sf*;	H. and S, mean of observations of 1823.

The angles of 1779 and 1781 contradict each other, but the earlier is to be preferred, as in the MS. observation the circumstance of the stars being exactly in the direction of the equatorial motion and running together along the hair is particularly mentioned. The motion of these stars appears exceedingly capricious, the diminution of angular velocity since the year 1821 being so great and sudden as almost to throw a doubt on the observations made after that time. The agreement between our measures and those of M. STRUVE in that year, is sufficient to prove that we have observed the same star, and all other observations on it were made with the utmost care, in nights selected for their clearness, &c., and when the telescope was in its best action. Had the angular

70 *p* Ophiuchi continued.

motion continued nearly uniform from 1821, at its former rate of about 6° per annum, the position, at the time of the observations of 1822, should have been 60° *sf*, and on the 9th of April, 1823, about 54°. The notes annexed to the last set of observations contain the result of two trials made to ascertain the quantity of error the eye would bear in a single measure of this star. When purposely set, either way, 2°½ from the mean, the micrometer wire was found to be intolerably out of place. The corrections were cautiously made so as barely to give satisfaction, and from their readings off we are fairly entitled to conclude that no satisfactory measure can deviate above a degree, or a degree and a half from the truth, at most. On the 9th April the micrometer wire was purposely set to 90°— 33 = 57° *sf*, but its position was so offensive as to be marked " shocking ;" and when set to 51° it had no appearance of ever being intended for a measure, the wire actually passing between the stars. Admitting the correctness of our measures and those of M. Struve in 1819, 1820, the mean angular velocities, during the several different intervals of the observations, will stand as follows:

Observation of 1779	to that of 1802	—mean annual motion . .	5°.046.
1802 . . .	1804	. . . .	6 .619.
1804 . . .	1819	. . . .	9 .868.
1819 . . .	1820	. . . .	11 .000.
1820 . . .	1821	. . . .	5 .623.
1821 . . .	1822	. . . .	1 .037.
1822 . . .	1823	. . . .	1 .610.
1779 . . .	1823	—mean of the whole interval	6 .811.

To account for so enormous a variation of angular velocity,

70 *p* Ophiuchi continued.

within four years, would require very extravagant suppositions. Some of the observations are more probably erroneous, but where to place the error is not so easy to determine. If it rest with us, inattention to usual precautions is assuredly not its cause.

No. CCLIX. R. A. $17^h\ 57^m$; Decl. $64^\circ\ 9'$ N.

H. C. 362; STRUVE, 563;

As nearly equal as possible; if any difference, the northern precedes; 7th magnitude.

June 10, 1823.
Five-feet Equatorial.
np or *sf*

Position.		Distance. Parts.	
$90^\circ - 75^\circ.40'$	S	66. 6	S
74.30	S	67. 2	S
75.32	S	70. 5	S
75.55	S	69. 0	S
74. 0	S	67. 8	S
		67. 2	S
Mean — 75. 7		Mean = 68.05	
		Z = — 1.72	
		66.33	

Position $= 14^\circ\ 53'$ *np* or *sf*
Distance $= 20''.948$.

June 12, 1823.
Seven-feet Equatorial.
np

Position.		Distance. Parts.	
$90^\circ - 74^\circ.50'$	H	88. 9	H
74.25	H	90. 2	H
72.50	H	87. 0	H
73.15	H	88. 0	H
74.30	H	88. 6	H
Mean — 73.58		Mean = 88.54	

Position $= 16^\circ\ 2'$ *np*
Distance $= 21''.267$.

Mean result.

Position $15^\circ\ 27'$ *np*; *Distance* $21''.093$; 1823.45.

No. CCLX. R. A. $17^h\ 57^m$; Decl. 12° 0′ N.

III. 56; STRUVE, 564;

Very nearly equal; 7 and $7\frac{1}{4}$ magnitudes.

June 10, 1823.

Five-feet Equatorial.

sp

Position.	Distance. Parts.
° ′	
12. 4	22. 0
12.50	23. 4
11.20	24. 2
11. 5	23. 3
12. 0	24. 3
11.17 S	23. 2 S
Mean = 11.46	Mean = 23.40
	Z = − 1.72
	21.68

Position = 11° 46′ *sp*

Distance = 6″.846.

June 16, 1823.

Seven-feet Equatorial.

7 and $7\frac{1}{2}$ magnitudes. H.

Position.	Distance. Parts.	Distance. Parts.
° ′		
13.20	25. 9	31. 0
12.32	27. 0	30. 2
13. 3	29. 1	29. 3
13.15	29. 5	28. 4
13. 0 H	26. 8 H	21. 5 S
Mean = 13. 2	Mean = 27.66	Mean = 28.08
	Z = − 0.01	Z = − 0.01
	27.65	28.07

Position = 13° 2′ *sp*

Distance = 6″.648. H.

Distance = 6″.749 S.

Mean.

Position 12° 21′ *sp*; *Distance* 6″.748; 1823.45.

1783.22; Position 9° 42′ *sp*; Distance 7″.620; H. Catalogue of 1785.

1800.00; “ Duplex. Comes 7.8 æ magnitudinis 0″.6 precedit paulisper ad austrum.”

PIAZZI’s Catal. xvii, 362.

No. CCLXI. R. A. $18^h\ 1^m$; Decl. $3°\ 57'$ N.

73 *q* Ophiuchi; I. 87; STRUVE, 566.

Considerably unequal; 5 and 7 magnitudes; a power of 240 distinctly separates the two stars.

June 13, 1822.
Five-feet Equatorial.
sp

Position.		Distance. Parts.
° ′		
14.15 H		6. 0± H
17. 2 H		Z = − 0.17
14.28 H		5.83
13.14 H		
13. 0 H		
Mean = 14.24		

Position = 14° 24′ *sp*
Distance = 1″.841 ±

June 19, 1822.
Five-feet Equatorial.
sp

Position.		Distance. Parts.
° ′		
9. 40 S		5. 0 S
11.32 S		6. 2 S
12.20 S		5. 8 S
11.38 S		Mean = 5.67
10.40 S		Z = − 1.48
13.25 S		4.19
12.30 S		
11.50 S		
10.50 S		
9. 40 S		
Mean — 11.23		

Position = 11° 23′ *sp*
Distance = 1″.323

A difficult star to measure; the small star does not bear a good illumination; it would be a better object for the seven-feet equatorial. (S.)

April 10, 1823.
Five-feet Equatorial.

Distance. Parts.
6. 0 H
13. 0 H
Mean = 9. 5
Z = − 0.73
8.77

Distance = 2″.770.

73 *q* Ophiuchi continued.

Distance. Parts.		July 15, 1823. Seven-feet Equatorial. *sp*
9. 5	S	Distance = 2″.062.
10. 5		
9. 8		
11. 2		
9. 3		
8. 8		
8. 6		
9. 2		
Mean = 9.61		
Z = − 1.03		
8.58		

Stars on the meridian when measures were taken. S.

Mean.

Position (1822.46) 12° 23; *Distance* (1822.93) 1″.989.

Other measures are

1783.32;	Position 2° 48′ *sp*;	Interval $\frac{1}{3}$ or $\frac{1}{4}$ D;	H. Catal. of 1785.
1802.39;	5 17 *sp*;		D°. MS.
1819.65;	5 6 *sp*;	STRUVE, Additamenta, &c. 193.	

This star has undoubtedly increased in distance. In 1783 it was barely separated with 460. M. STRUVE, in 1819, observed the angle of position with no higher power than 126. However this is too small a power to excite great confidence in the measures of so close an object. The position appears subject to a slow but regular variation, if our measures be correct.

No. CCLXII. R. A. 18^h 1^m; Decl. 26° 5′ N.

100 Herculis; III. 41; STRUVE, 567;

Very nearly equal; 6th magnitude.

June 15, 1823.

Five-feet Equatorial.

sp or *nf*

Position.		Distance. Parts.	
° ′			
87.35	S	45. 8	S
88. 3		46. 2	
88.45		45. 2	
87.15		46. 2	
88.11		45. 4	
Mean = 87.58		Mean = 45.76	
		Z = − 0.13	
		45.63	

Position = 87°58′ *sp* or *nf*

Distance = 14″.410

Seven-feet Equatorial.

Same night.

Position.		Distance. Parts.	
° ′			
86.16	H	58. 5	H
87. 5		58. 2	
88. 0		59. 0	
87. 3		59. 8	
87.40		58. 8	
Mean = 87.13		Mean = 58.86	
		Z = 0.00	
		58.86	

Position = 87°13′ *sp* or *nf*

Distance = 14″.152

Mean result.

Position 87° 35′ *nf* or *sp*; *Distance* 14″.281; 1823.46.

No. CCLXIII. R. A. 18^h 7^m; Decl. 18° 49′ S.

Anonyma (Nova);

7 and 10 magnitude; large, white; small, blue.

July 11, 1823.

Seven-feet Equatorial.

nf

Position.		Distance. Parts.	
° ′			
77.35	S	231. 2	S
78.30		229. 0	
78.45		232. 7	
		231. 0	
Mean = 78.17		Mean = 230.97	
		Z = − 1.18	
		229.79	

Position = 78° 17′ *nf*

Distance = 55″.252.

No. CCLXIII. continued.

July 11, 1823.
Five-feet Equatorial.
nf

Position.		Distance. Parts.	
° ′			
76.50	S	171. 0 ±	S
77.45	S	163. 5	S
77.50	S		
77.28		Mean = 167.25	
		Z = − 1.32	
		165.93	

Position = 77° 28′ *nf*
Distance = 52″.403

Measures of distance with 5 feet little better than guesses. S.

Mean.

Position 77° 52′ *nf*; *Distance* 54″.302; *Epoch* 1823.53.

No. CCLXIV. R. A. $18^h\ 8^m$; Decl. 18° 38′ S.

STRUVE, 569;

Large, white; small, decidedly blue; 7th and 8th magnitudes.

June 15, 1823.
Five-feet Equatorial.
nf

Position		Distance. Parts.	
° ′			
35.40	S	53. 3	S
35.50	S	51. 8	S
37.30	S	50. 8	S
36.35	S	51. 6	S
36.20	S	52. 2	S
38.20	H	49. 5	H
38 30	H	50. 1	H
38.10	H	52. 5	H
40. 0	H	55. 0	H
37.45	H	55. 5	H
38.30	H	51. 0	H
37. 5	H		
35.33	H		
Mean = 37.22		Mean = 52.12	
		Z = − 0.13	
		51.99	

Position = 37° 22′ *nf*
Distance = 16″.419.

No. CCLXV. R. A. $18^h\,12^m$; Decl. $25°.28'$ N.

Near 105 Herculis; I. 86;

A little unequal.

Position.		June 5, 1823.	Distance. Parts.	
° ° ′		Seven-feet Equatorial.		
90—7.20	S	*np*	22. 0	S
7.45	S		18. 5	H
6.15	S	10th and 11th magnitudes.	Mean = 20.25	
5.40	S		Z = — 1.17	
8.15	S	Position = 82° 48′ *np*	19.08	
9. 5	S	Distance = 4.″587.		
7.45	H			
6. 2	H			
6.25	H			
6.34	H			
8.10	H			
Mean — 7 .12				

Measures of considerable difficulty; stars very faint.

1783.32; Position 79° 24′ *np*; H. Catal. of 1785.
1802.75; 22 27 *np*; H. "Account of Changes," &c." But the identity of the star then observed with that of 1783 very questionable.

If the star observed by us be that measured by Sir WILLIAM HERSCHEL in 1783, its position has undergone no material change, and the alteration surmised by him is not verified; but of this there are good grounds for doubt, the distance being too considerable for a star of the first class, and the object altogether being so faint as to be recognised with great difficulty.

No. CCLXVI. R. A. $18^h\ 12^m$; Decl. $15°\ 10'$ S.

(H. C. 298); STRUVE, 570;

Equal; both of the $8\frac{1}{2}$ magnitude.

June 16, 1823.
Five-feet Equatorial.
sp or *nf*

Position.		Distance. Parts.	
° ′			
53. 3	S	43. 7	S
53.16		47. 5	
53.35		45. 8	
51.50		45. 5	
52.47		46. 5	
50.25	H	45. 3	
50.40		44. 3	H
51. 3		44. 6	
50.20		44. 5	
50.15		42. 0	
50.30		43. 0	
Mean = 51.37		Mean = 44.79	
		Z = − 0.17	
		44.62	

Position = $51°37'$ *sp* or *nf*
Distance = $14''.091$.

No. CCLXVII. R. A. $18^h\ 13^m$; Decl. $79°\ 58'$ N.

(40 Cephei vel 40 Dracon); IV. 67;

Double; nearly equal.

June 15, 1821.
Five-feet Equatorial.
sp

Position.		Distance. Parts.	
° ′			
34.35	S	66. 5	S
34.56		66. 1	
35.30		67. 0	
34.10	H	68. 5	H
34. 8		68. 3	
33. 5		66. 5	
Mean = 34.24		Mean = 67.15	
		Z = + 0.05	
		67.20	

Position = $34°24'$ *sp*
Distance = $21''.223$.

(40 Cephei vel 40 Dracon) continued.

February 20, 1823.

Five-feet Equatorial.

sp

Position.		Distance. Parts.
° ′		
34.10 H		68.5
37.20 H		70.0
35.55 H		
36.11 H		Mean = 71.25
34.14 H		Z = − 2.29
Mean = 35.34		68.96

Position = 35° 34′ *sp*

Distance = 21″.779

The night exceedingly bad.

Mean.

Position 34° 56′ *sp* ; *Distance* 21″.362 ; 1822.29.

1782.78;	Position 34° 27′ *sp*;	Distance 20″.65;	H. Cat. of 1785.
1816.9;	33 12;	19″. 9;	STRUVE, Catalogus i. Stella 161.
1800.00;	32 35 *sp*;	20.986;	PIAZZI, Δ R A = 1′ 45′.5; Δ decl. 11″.3.

A confusion in FLAMSTEED's catalogue and observations gave rise to the idea of a considerable relative motion and approach of these stars, but the measures here adduced sufficiently disprove its existence.

No. CCLXVIII. R. A. $18^h\ 18^m$; Decl. $0^\circ\ 5'$ N.

59 α Serpentis; STRUVE, 575; I. 12;

Double; considerably unequal; large, white; small, blue; the small star bears all the illumination; 6th and 9th magnitudes.

June 14, 1822.
Five-feet Equatorial.
np

Position. ° ° ′		Distance. Parts.	
90—39.10	S	14. 2	S
39. 3	S	15. 0	S
41. 0	S	14. 8	S
41. 7	S	14. 4	S
41.10	S	14. 9	S
41.34	S	14. 5	S
42.32	H	11. 5	H
42.49	H	12. 5	H
41.42	H	14. 0	H
40.52	H	11. 6	H
40.35	H	11. 8	H
42.58	H	13. 5	H
		12. 6	H
		13. 6	H
		13. 1	H
		13. 3	H
Mean — 41.13		Mean = 13.46	
		Z = — 0.17	
		13.29	

Position = $48^\circ\ 27'$ *np*
Distance = $4''.197$.

April 10, 1823.
Five-feet Equatorial.
np

Position. ° ° ′	Distance. Parts.	
90—41.45	16. 0	H
	15. 2	H
	14. 0	H
	13. 0	H
	15. 8	H
	16. 5	H
	Mean = 15.08	
	Z = — 0.73	
	14.35	

Position = $48^\circ\ 15'$, single measure.
Distance = $4''.533$

59 α Serpentis continued.

Position.	June 12, 1823.	Distance Parts.
° ° ′	Five-feet Equatorial.	
90— 41.22	7th and 9th magnitndes.	10. 0
43.50	Small blue. S.	13. 0
40.40		11. 0
41.30 S	Position = 47° 32′	11. 5 S
44.30	Distance = 3″.534.	11. 0
42.55		10. 2
44. 0		10. 0
41. 0		
Mean — 42.28		Mean = 10.96
		Z = + 0.23
		11.19

Mean result.

Position 48° 5′ *np*; *Distance* 4″.151 : 1822.95.

1781.79 Position 44° 33′ *np*; Interval 1 D, or $1\frac{1}{3}$ D; H. Cat. of 1782 (with 227), $2\frac{1}{2}$ D, with 460.

1802.34 42 25 *np*; Interval 4 or 5 D; H. Account, &c.

1819.61 40 3 *np*; Distance 3″.76; STRUVE, Additamenta, 193.

There is a great disagreement between our angle and M. STRUVE'S, but the latter is only the result of a single measure; and in the case of very close stars of very unequal magnitudes, and of opposite colours, a single measure can never have any dependance placed on it. We have instances of this kind in ε Bootis, Rigel, STRUVE'S N° 430, &c. The distance however has undoubtedly undergone a remarkable change; in 1781 the interval with 460 was $2\frac{1}{2}$ D, corresponding to about 4″ of distance between the centres. In 1802 it was four or five diameters, which could hardly represent less than 7″ central distance, while it now seems again on the decrease. This agrees with the idea of a rapid rotation of one star about the other in a plane nearly passing through the eye, the small star being at its greatest elon-

59 α Serpentis continued.

gation about 1802. The inference is an interesting one, as this star seems not unlikely to furnish another example in addition to those already known of a sidereal occultation, which the difference of colours of the two stars, and the rapidity of their motion, will render a most curious phænomenon.

No. CCLXIX. R. A. $18^h\ 21^m$; Decl. $58°\ 42'$ N.

39 Draconis; I. 7; Struve, 576.

Triple; A of 5; B of 10; C of $6\frac{1}{2}$ magnitudes.

June 15, 1823.
Seven-feet Equatorial.
Measures of AC
nf

Position. ° ′		Distance. Parts.	
68. 5	S	374. 0	S
69. 0	S	376. 5	S
68.15	S	373. 2	S
67.30	S	372. 3	S
67.55	S	372. 0	S
68.20	H	374. 0	H
68.15	H	378. 0	H
68.33	H	375. 5	H
67. 0	H	379. 0	H
68. 0	H	377. 0	H
Mean = 68. 5		Mean = 375.15	
		Z = − 0.00	
		375.15	

Position = 68° 5′ *nf*
Distance = 1′ 30″.201.

August 15, 1823.
Seven-feet Equatorial.
Measures of AB.
5 and 10 magnitudes.
nf

Position. ° ′		Distance. Parts.	
85.45	S	17. 3	H
91. 0	S	17. 8	H
91.10	S	16. 0	H
82.15	S	15. 0	H
88.20	S	18. 0	H
87. 0	S	16. 0	H
86.15	S	14. 5	H
Mean = 87.24		Mean = 16.37	
		Z = − 1.01	
		15.36	

Position = 87° 24′ *nf*
Distance = 3″.693.

Measures of angle excessively difficult.

39 Draconis continued.

Position.	August 20, 1823.	Distance. Parts.
° ° ′	Five-feet Equatorial.	
84.30 ⎫	*nf*	11. 5 ⎫
84.38 ⎪		11. 5 ⎪
85.10 ⎬ S		11. 0 ⎬ S
84.45 ⎪		10. 8 ⎪
84. 0 ⎪		11. 0 ⎭
84.55 ⎭	Position = 84° 40′ *nf*	
Mean = 84.40	Distance = 3″.470.	Mean = 11.16
		Z = − 0.17
		10.99

Measures excessively difficult; small star bears no illumination.

Mean.

AB. *Position* 86° 5′ *nf*; *Distance* 3″.599; *Epoch* 1823.63.
AC 68 5 *nf*; 1′ 30″.201; 1823.46.

Other observations are,

1780.78; AB. Position 77° 19′ *nf*;
AC. 63 55 *nf*;
1802.83; AB. 83 41 *nf*; Interval = 1 diameter.
1814.08; AC. 72 ± *nf*; Distance = 1′¼; STRUVE, Dorp. Obs. vol. 1. Catalogus ii. p. 51, by mere estimations.

M. STRUVE suspects the angle of position of AC to be changed. It is perhaps a little, an error of 4° being too much to commit in the measure of two stars a minute and a half asunder. He has not observed the close star. The angle of position of this was shown by Sir W. HERSCHEL, in his paper of 1804, to have undergone a change of 6° 22′ in the interval of 22 years, from 1780 to 1802. Our observations confirm this by pointing out a further change in the same direction—not indeed nearly so considerable, but enough

39 Draconis continued.

to show its reality. The mean angular velocity, deduced from the whole period, is 0°.205 per annum, in the direction *np sf* or retrograde. The distance seems but little changed.

No. CCLXX. R. A. $18^h\ 30^m$; Decl. 52° 13′

H. C. 300; STRUVE, 578;

Double; 6 and 10 magnitudes.

June 16, 1823.

Five-feet Equatorial.

np

Position.		Distance. Parts.
° ° ′		
90—85.10		82. 5
85.41		83. 7
85.25 } S		83. 2 } S
85.57		84. 0
84.55	Position = 4° 34′ *np*	82. 8
Mean — 85.26	Distance = 26″.226.	Mean = 83.24
		Z = — 0.17
		83.04

No. CCLXXI. R. A. $18^h\ 30^m$; Decl. 41° 7′ N.

H. C. 294; STRUVE, 579.

As nearly equal as possible; if any difference, *np*; 8 and $8\frac{1}{10}$ magnitudes; bear a very good illumination.

June 11, 1823.

Seven-feet Equatorial.

n p

Position.		Distance. Parts.
° ° ′		
90—18.45		26. 5
21. 0		27. 2
21. 0 } S		27. 8 } S
21. 0		26. 3
19.12		27. 8
18.20	Position = 70° 7′ *n p*	26. 7
Mean — 19.53	Distance = 6″.433.	Mean = 27.05
		Z = — 0.29
		26.76

H. C. 294 continued.

June 12, 1823.
Seven-feet Equatorial.
Exactly equal; 7 magn. H.
np or *sf*

Position.	Distance. Parts.
90° — 18° 12′	25. 0
17.30	25. 2
17.15	26. 0
18.11	26. 8
17.30	25. 5
} H	} H
Mean — 17.44	Mean = 25.70
	Z = − 0.09
	25.61

Position = 72° 16′ *np*
Distance = 6″.157.

June 15, 1823.
7 and 7½ magnitudes.
Seven-feet Equatorial.
np or *sf*

Position.	Distance. Parts.
90° — 20° 55′	25. 7
22.40	23. 8
21.45	24. 4
19.45	23. 7
21.25	23. 3
21.40	
} S	} H
Mean — 21.22	Mean = 24.18
	Z = 0.00
	24.18

Position = 68° 38′ *np* or *sf*
Distance = 5″.814.

Position.	Distance. Parts.
20° 5′	25. 1
18. 2	23. 0
20.30	24. 2
19.45	23. 6
21. 0	20. 5
20.40	
} H	} H
Mean — 20. 0	Mean = 23.28
	Z = 0.00
	23.28

Position = 70° 0′ *np* or *sf*. H.
Distance = 5″.597.

Mean result.

Position 70° 15′ *np*; *Distance* 6″.000; 1823.45.

Remark. The measures of this star, particularly those of the angle, are very unsatisfactory; but so many having been taken, it is impossible that the mean result can be far from the truth. The angles taken by Mr. S. on June 11, and by Mr. H. on June 15, agree very perfectly with it. Two of the mean distances at least must be four-tenths of a second in error.

No. CCLXXII. R. A. $18^h\ 31'$; Decl. $38°\ 37'$ N.

α Lyræ; STRUVE, 581; V 39;

Double; excessively unequal; small star a mere point; bears a little illumination.

May 23, 1822. Five-feet Equatorial. *sf*

Stars $4\frac{1}{2}$ Hours East of the Meridian.

Position.
° ° ′
90—47.30
47.30
47. 0
48.35
Mean — 47.39

Position = 42° 21′ *sf*

July 1, 1822. Seven-feet Equatorial. *sf*

Position.	
° ° ′	
90—48. 7	S
47.50	S
48.37	S
47.37	S
Mean — 48. 3	

Position = 41° 57′ *sf*

Distance = 39″.662.

July 3, 1822.

Distance. Parts.	
165. 3	S
164. 0	S
165. 7	S
162. 0	S
Mean = 164.25	
Z = + 0.71	
164.96	

The night of July 3 very unfavorable.

August 15, 1822. Seven-feet Equatoial. *sf*

Position.	
° ° ′	
90—47.25	S
48.30	S
48. 0	S
47.35	S
48.40	S
47.16	S
Mean — 47.54	

Position = 42° 6′ *sf*

August 12, 1823. Seven-feet Equatorial. *sf*

Position.	
° ′	
90—.48. 0	S
48.40	S
46.50	S
48. 0	S
48. 5	S
48. 0	S
Mean — 47.56	

Position = 42° 4′ *sf*

Distance = 43″.226

Distance. Parts.	
183. 2	S
176. 5	S
182. 8	S
181. 2	S
183. 8	S
182. 3	S
Mean = 181.63	
Z = — 1.85	
179.78	

α Lyræ continued.

Distance. Parts.	
181.0	S
176.5	
175.0	
178.2	
178.8	
178.0	
181.0	
179.3	
176.0	
177.5	
Mean = 178.08	
Z = − 1.67	
176.41	

August 19, 1823.

Seven-feet Equatorial.

sf

Distance = 42″.416.

Measures extremely satisfactory.

September 16, 1823.

20-feet reflector. H.

The angle estimated at 45° *sf*; it is nearly in the direction of ζ Lyræ. The small star is perfectly distinct, and bears a great illumination in addition to the dazzling light of α, with which the whole field is filled. It is not possible to overlook it, being a very conspicuous object. Distance 40″ or 45″.

Mean.

Position 42° 7′ *sf*; *Distance* 42″.108; *Epoch* 1822.87.

Other observations are,

1782.36; Pos. 26° 46′ *sf*; Dist. 37″.74; H. Catal. of 1782.

1792.32; 26 14 *sf*; 42 .99; Ditto. (MS.) 20-feet reflector. 130 small stars were counted in the field at the same time.

The proper motions of α Lyræ, given by Piazzi, are + 0″.28 in R. A., and + 0″.25 in declination. The motion of the star is therefore in a direction 42° inclined to the

α Lyræ continued.

parallel in the *np* quadrant, and therefore making an angle of 84° with the position of the small star. Its velocity is 0″.375 per annum, or 15″ in 40 years. The change observed in the angle of position of the small star is in the same sense therefore as that which would result from the proper motion of α, the small star remaining at rest, and its quantity (reckoning from the year 1792, the observations of that year being of course to be preferred from the great superiority of the instrument employed) 15° 54′, is almost precisely that which such a supposition would give it (15° 47′), while the small decrease in the distance, since 1792, is also conformable to the same hypothesis. There is therefore every presumption: 1st, that the proximity of the large and small stars is merely apparent and accidental, no connection existing between them; and 2dly, that the proper motions assigned to α are not very remote from truth.

No. CCLXXIII. R. A. $18^h\ 36^m$; Decl. 34° 32′ N.

IV. 94; Struve, 584;

Double; 6 and 7 magnitudes; large, white; small, bluish.

Position.	June 16, 1823.	Distance. Parts.
° ′	Five-feet Equatorial.	
5.30	*nf*	78. 4
6. 2		77. 2
6.30 S		78. 5 S
6. 0		78. 2
5.11	Position = 5° 51′ *nf*	78. 5
Mean = 5.51	Distance = 24″.630.	Mean = 78.16
		Z = − 0.17
		77.99

1783.63; Pos. 5° 24′ *nf*; Dist. 22″.90; H. Catal. of 1785.

No. CCLXXIV. R. A. $18^h\ 36^m$; Decl. $10^\circ\ 39'$ S.

H. C 296; STRUVE, 585;

$7\frac{1}{2}$ and $8\frac{1}{2}$ magnitudes; large, white; small, blue.

July 24, 1823.

Five-feet Equatorial.

np

Position.		Distance. Parts.	
° ° ′			
90—22.57	S	17. 5	S
22.50		17. 3	
22.40		20. 5	
24. 5		19. 1	
24. 0		17. 8	
Mean — 23.42		Mean = 18.44	
		Z = − 1.64	
		16.80	

Position = $66^\circ\ 18'$ *np*

Distance = $5''.306$.

Very difficult to measure with the five-feet instrument.

No. CCLXXV. R. A. $18^h\ 37^m$; Decl. $1^\circ\ 9'$ S.

5 Aquilæ; 9 of the 145;

7 and 8 magnitudes.

June 11, 1823.

Seven-feet Equatorial.

sf

Position.	
° ° ′	
90—57.25	S
55.30	
56.30	
56.50	
56.15	
57.10	
Mean — 56.37	

Position = $33^\circ\ 23'$ *sf*

June 15, 1823.

Five-feet Equatorial.

Large, white; small, purple; a lovely object.

6 and 8 magnitudes.

Position.	
° ° ′	
90—58.20	H
58.25	
59.48	
56.30	
57.30	
57.15	
Mean — 57.58	

Position = $32^\circ\ 2'$ *sf*

5 Aquilæ continued.

June 29, 1823.

Five-feet Equatorial.

	Distance. Parts.	
	46. 8	S
	48. 5	
	47. 5	
	46. 8	
	46. 7	
	46. 5	
	45. 3	
Mean =	46.87	
Z = −	1.06	
	45 81	

Distance = 14″.468.

Mean.

Position 32° 42′ *sf* ; *Distance* 14″.468 ; *Epoch* 1823.45.

The angles are probably exact. The distance is liable to some uncertainty, and cannot be regarded as standard.

No. CCLXXVI. R. A. $18^h\ 38^m$; Decl. 39° 27′ N.

4 Fl. ; ε Lyræ ; II. 5 ; Struve, 587 ;

Double ; unequal ; both white.

June 15, 1821.

Five-feet Equatorial.

nf

	Position. ° ′	
	62.37	H
	62.43	
	62.31	
	62.30	S
	62.45	
	63. 0	
Mean =	62.41	

Position = 62° 41′ *nf*

Distance = 3″.654.

	Distance. Parts.	
	10. 8	H
	11. 2	
	11. 5	
	12. 1	S
	11. 9	
	11. 6	
Mean =	11.52	
Z = +	0.05	
	11.57	

4 Fl.; ε Lyræ continued.

June 13, 1822.
Five-feet Equatorial.
n f

Position.		Distance. Parts.	
66°.55′	S	13. 5	H
66.15	S	12. 4	H
64.12	S	12. 7	H
65.56	S	13. 1	H
65.12	H	13. 1	S
65.15	H	13. 9	S
66.19	H	12. 0	S
64.41	H	13. 5	S
Mean = 65.36		Mean = 13.02	
		Z = − 0.17	
		12.85	

Position = 65° 36′ *nf*
Distance = 4″.059.

September 12, 1823.
Five-feet Equatorial.
nf

Position.		Distance. Parts.	
65°.30′	S	12. 3	S
65.35	S	13. 6	S
66.21	S	13. 7	S
63.35	S	12. 3	S
62.30	S	12. 5	S
65.12	S	13. 8	S
63.30	S		
Mean = 64.36		Mean = 13.03	
		Z = − 0.62	
		12.41	

Position = 64° 36′ *nf*
Distance = 3″.919.

September 13, 1823.
Seven-feet Equatorial.
nf

Position.		Distance. Parts.	
63°.30′	S	19. 8	S
63.47	S	19. 7	S
62.35	S	19. 0	S
63.15	S	20. 2	S
63. 5	S	18. 8	S
		20. 2	S
Mean = 63.14		Mean = 19.62	
		Z = − 1.32	
		18.30	

Position = 63° 14′ *nf*
Distance = 4″.400.

Mean.

Position 64° 7′ *nf*; *Distance* 4″.010; *Epoch* 1822.12.

4 ε Lyræ Borealior continued.

Other measures are,

1779.83;	Position 56° 5′ *nf*;	Distance 3″.437;	single measure; H. Cat. of 1782.
1803.83;	59 14 *nf*;		H. Mean of 3 measures in 1802 and 1804,
1819.69;	60 42 *nf*;	Distance 3″. 83;	STRUVE, Additam. p. 194.
1821.02;	64 18 *nf*;	3 707;	from Δ decl. = 3″.34; STRUVE, iii. 143.

The measures on the whole are favourable to a slow variation in the angle of position, as surmised by Sir WILLIAM HERCHEL in 1804; but as the amount does not exceed 0° 19 per annum, it must be regarded as still open to further enquiry.

No. CCLXXVII. R. A. $18^h\ 38^m$; Decl. 39° 27′ N.

Debilissima inter 4 (ε) et 5 Lyræ.

October 27, 1823.

Twenty-feet Reflector.

Equal, or nearly so; each of the 15th or 20th magnitude.

Its existence cannot be even suspected with either of the two Equatorials. The seven and ten-feet reflectors (the former of six, the latter of nine inches aperture) in like manner fail to give any indication of it; but all of them shew a small star of about the 10th magnitude preceding them both, and making an isosceles triangle of about 100° at the vertex with ε and 5. The twenty-feet reflector however shews a double star, whose distance is one fourth that of ε from 5 (*i.e.* 53″) in the middle between them. Its

Debilissima inter 4 (ε) et 5 Lyræ continued.

position is such that the line joining the two stars makes an angle of about 50° with that joining ε and 5, which latter line is nearly in the direction of the meridian.

Although these are only estimations, and of course inaccurate, yet as this star naturally refers itself to ε Lyræ, and can only be found by it, it was thought adviseable to place its description here rather than defer it.

No. CCLXXVIII. R. A. $18^h\ 38^m$; Decl. 39° 27′ N.

5 Lyræ; STRUVE, 588; II. 6;

5 FL. Lyræ.

June 15, 1821. Five-feet Equatorial. *sf.*

Distance 3″.259; H, 3 measures; Angle = 72° 30′ H. Single measure.

June 13, 1822. Five-feet Equatorial. *n p* or *s f* Equal.

Position. ° ° ′		Distance. Parts.	
90—20.38	H	13. 0	H
20.31	H	12. 9	H
20. 0	H	13. 9	H
20.53	H	12. 2	H
19.55	S	12. 2	S
20.11	S	12. 5	S
20.22	S	13. 1	S
20.35	S	13. 0	S
Mean — 20.23		Mean = 12.85	
		Z = — 0.17	
		12.68	

Position = 69°37′ *sf* or *np*
Distance = 4″.004.

Mean 69° 56′ *sf* or *np*; *Distance* 3″,801; 1822.42.

Other measures are,

1779.83;	Position 83° 28′ *sf*;	H. Catalogue of 1782.
1804.08;	77 3 *sf*;	H. mean of 5 MS. measures in 1802 and 1804.
1819.73;	70 18 *sf*;	STRUVE, Additamenta, p. 194.

5 Lyræ continued.

1819.73; Position		Distance 3″. 43; D°. by projection micrometer.
————		2″.972; from Δ R A = 0^s.088.
1821.92;	70° 0 *sf*;	3″.480; from Δ decl. = 3″.270, Struve, vide Zach viii. 527.
1822.42;	69 37 *sf*;	3″.801; H. and S. ut supra; mean result.

This is the south following of the two double stars ε and 5 Lyræ. The change surmised by Sir William Herschel in 1804 seems to be well borne out by subsequent observations, the total alteration in the angle being no less than 13° 51, averaging 0.325 per annum in the direction *n p s f*, or retrograde.

No. CCLXXIX. R. A. 18^h 38′; Decl. 37° 25′ N.

ζ Lyræ; V. 2; Struve, 589;

Large, white; small, blue; 3rd and 4th magnitudes.

June 5, 1823.

Five-feet Equatorial.

sf

Position. ° ° ′		Distance. Parts.	
90—30. 0	S	140. 9	S
31.30	S	144. 0	S
28.50	S	142. 2	S
32. 5	S	140. 8	S
31.12	S	140. 1	S
30.30	S	138. 0	S
29.36	H	141. 5	S
30.20	H	143. 5	H
28.10	H	140. 5	H
29.14	H	140. 2	H
28.40	H	142. 8	H
31.35	H	139. 0	H
		142. 5	H
		142. 0	H
Mean — 30. 9		Mean = 141.29	
		Z = — 1.21	
		140.08	

Position = 59°.51′ *sf*

Distance = 44″.240.

ζ Lyræ continued.

The coincidence both in angle and distance with β Lyræ is remarkable. They were observed one after the other, and for a moment were supposed to be the same star, taken by mistake.

Other measures are,

1782.31; Position 62° 18′ *sf*; Distance 41″.99; H. Catal. of 1782.
1819.77; 58 56 *sf*; STRUVE, Dorpat. Obs. ii. 165.— Obs. 87, 151.

BIANCHINI relates in his observations (Verona, 1737) that the most southern of the two stars of ζ Lyræ was occasionally seen double by him, and sometimes accompanied with other small stars, through several telescopes, by CAMPINI and CELLIUS, of great focal length. It is also said to have been seen through a 12 feet telescope (by SHORT) surrounded by five small stars. Doubtless, in a part of the heavens so crowded with stars, numbers of minute stars may be seen near it in good telescopes; but the division of one of the large stars into two is a fact we may be allowed to doubt. Many strange things were seen among the stars before the use of powerful telescopes became common among observers.

No. CCLXXX. R. A. $18^h\ 42^m$; Decl. $10°\ 47'$ N.

H. C. 170; STRUVE, 592;

A very pretty double star; 7th and 9th magnitndes.

Position.		Distance.
° ′	June 16, 1823.	Parts.
84.12	Five-feet Equatorial.	16. 0
85.10	*s p*	14. 8
86. 5 S		14. 8 S
86.50		15. 5
86. 5		16. 2
84.28		14. 8
Mean = 85.28	Position = 85° 28′ *sp*	Mean = 15.35
	Distance = 4″.794.	Z = − 0.17
		15.18

No. CCLXXXI. R. A. $18^h\ 43^m$; Decl. $33°\ 10'$ N.

β Lyræ; V. 3; STRUVE, 593;

Quadruple, A. B. 2 and 8 magnitudes; large, white; small, blue.

C is about 45° *np*; D about 65° *nf*; B bears the whole illumination; C and D 9 and 10 magnitudes.

Position.		Distance.
° ° ′	June 13, 1821.	Parts.
90—28.36	Five-feet Equatorial.	146. 7
30. 0 H	*sf*	145. 3 H
29.56		145. 7
29.30		146. 0
Mean — 29.30	Position = 60° 30′ *s f*	Mean = 145.92
	Distance = 46″.340.	Z = + 0.81
		146.73

β Lyræ continued.

June 5, 1823.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
90°—30°. 0′	S	147. 0	S
30.35	S	146. 2	S
30.15	S	145. 3	S
29.12	S	144. 9	S
30.34	S	144. 4	S
29.48	H	148. 0	H
30. 5	H	148. 5	H
30.13	H	145. 1	H
31.15	H	146. 2	H
29.42	H	146. 0	H
Mean - - 30.10		Mean = 146.16	
		Z = — 1.21	
		144.95	

Position = 59° 50′ *sf*
Distance = 45″.778.

Mean.

Position 60° 1′ *sf*; *Distance* 45″.939; 1822.87.

1782.36; Position . . 60° 28′ *sf*; Distance 43″. 95; H. Cat. of 1782.
1819.76; Position of A B 60 9 *sf*; 47 8; STRUVE, Additam.
1821.81; 60 36 46 006; (from Δ Decl = 40″.08), STRUVE; vide ZACH viii. p. 525.

1819.76; Position of A C 48 36 *np*; Distance 1′ 6″.6
——— ——— of A D 67 36 *nf*; 1′ 17″.0 } STRUVE, Additam. p. 194.

No. CCLXXXII. R. A. $18^h\ 48^m$; Decl. 33° 46′ N.

H. C. 19; STRUVE, 596;

6 and 8 magnitudes; large, white; small, blue.

June 6, 1823.
Seven-feet Equatorial.
np

Position.		Distance. Parts.	
90°—10°.45′	S	195. 0	S
11. 0	S	194. 5	S
10.50	S	194. 0	S
10.30	S	193. 5	S
10. 0	S	193. 7	S
9.30	H	191. 0	H
8.50	H	190. 0	H
8.30	H	189. 9	H
9. 0	H	189. 0	H
8.30	H	191. 1	H
Mean — 9.45		Mean = 192.17	
		Z = — 0.38	
		191.79	

Position = 80°.15′ *np*
Distance = 46″.114

H. C. 19; STRUVE, 596; continued.

Distance. Parts.		
147. 7		
145. 0		
150. 5	S	June 10, 1823. Five-feet Equatorial.
144. 0		
147. 5		Distance = 45″.905.
147. 5		
Mean = 147.07		
Z = − 1.72		
145.35		

Mean result.

Position 80° 15′ *np*; *Distance* 46″.035; 1823.44.

No. CCLXXXIII. R. A. 18^h 48^m; Decl. 3° 58′ N.

θ Serpentis; IV. 6; STRUVE, 595;

Double; very nearly equal; both stars yellowish.

June 13, 1821.
Five-feet Equatorial.
sf

Position. ° ° ′		Distance. Parts.	
90—75.47	H	67. 9	H
76.50		68. 2	
75.30		69. 0	
76.19		68. 1	
Mean — 76. 6		Mean = 68. 3	
		Z = + 0.81	
		69.11	

Position = 14° 54′ *sf*
Distance = 21″.826

June 24, 1822.
Five-feet Equatorial.
sf

Position. ° ° ′		Distance. Parts.	
90—75.29	S	68. 8	S
76. 9		71. 0	
75.50		69. 9	
75.41		69. 3	
75.54		69. 4	
76. 6		69. 0	
75. 4		70. 7	
76.14		71. 0	
Mean — 75.48		Mean = 69.89	
		Z = − 1.48	
		68.41	

Position = 14° 12′ *sf*
Distance = 21″.605

Stars very steady, and neatly defined.

θ Serpentis continued.

Mean result.

Position 14° 26′ *sf*; *Distance* 21″.679; *Epoch* 1822.11.

1755.00;	Position 19° 0′ *sf*;	Distance 22″.209;	BRADLEY } Cited by STRUVE.
1778.00;	19 18 *sf*;	22 21;	MAYER } Cited by STRUVE.
1780.54;		19 375;	H. Catal. of 1782.
1800.00;	9 17 *sf*;	21 684;	PIAZZI, Δ R A = 21″.4, Δ decl. = 3″.5.
1819.63;	14 9 *sf*;	22 52;	STRUVE, Additam. p. 180.

No material change appears to have taken place in these stars; the angles of position deduced from differences of R. A. and declination not micrometrically observed, being too vague to place much reliance on. The mean of BRADLEY'S and PIAZZI'S angles is exactly that of STRUVE. According to PIAZZI, however, BRADLEY makes the position *nf* instead of *sf*.

No. CCLXXXIV. R. A. 18h 49m; Decl. 59° 10′ N.

o Draconis; IV. 20; STRUVE, 597;

Double, very unequal; large, strongly red; small, blue.

June 13, 1821.

Five-feet Equatorial.

np

Position.	Distance. Parts.
° ° ′	
90— 9.45 } H	91. 6 } H
10. 1	96. 0
9.42	91. 5
10. 6	95. 0
	94. 0
Mean — 9.53	Mean = 93.62
	Z = + 0.81
	94.43

Position = 80° 7′ *np*

Distance = 29″.822

o Draconis continued.

June 24, 1822.

Five-feet Equatorial.

np

Position.		Distance. Parts.
° ° ′		
90—11.49	S	97. 5
11. 5	S	96. 5
11.26	S	96. 3
11.12	S	96. 0
10.50	S	97. 0
10.45	S	96. 5
11.30	S	96. 0
10.44	S	95. 5
11. 5	S	96. 3
11.30	S	97. 3
Mean — 11.11		Mean = 96.51
		Z = − 1.48
		95.03

Position $= 78^\circ\ 49'$ *np*

Distance $= 30''.012$

Measures very accurate.

Mean.

Position $79^\circ\ 11'$ *np*; *Distance* $29''.949$; *Epoch* 1822.14.

1781.68; Position $90^\circ \pm n$; Distance $26''.65$; H. Catal. of 1782.

1814.11 $80^\circ\ 48'$ *np*; STRUVE, Catalogus ii. Dorpat Obs. i. 51.

No. CCLXXXV. R. A. $18^h\ 54^m$; Decl. $0^\circ\ 58'$ S.

PIAZZI, XVIII. 274; STRUVE, 601.

7 and 9 magnitudes; do not bear a good illumination.

June 15, 1823.

Seven-feet Equatorial.

sf

Position.		Distance. Parts.	
° ° ′			
90—31.15	S	111. 5	S
31.32	S	108. 0	S
30.45	S	109. 2	S
30.50	S	109. 8	S
31.22	S	109. 5	S
31.40	H	Mean = 109.60	
31.10	H	Z = − 0.72	
30.35	H	108.88	
31.15	H		
31.30	H		
Mean — 31.11			

Position $= 58^\circ\ 49'$ *sf*

Distance $= 26''.178$.

PIAZZI XVIII. 274; STRUVE, 601; continued.

Distance. Parts.	
104. 3	H
107. 5	H
112. 0	H
110. 8	H
111. 2	H
110. 5	H
106. 0	H
Mean = 108.90	
Z = − 1.16	
107.74	

June 29, 1823.
Seven-feet Equatorial.

Distance = 25″.905.

Mean result.

Position 58° 49′ *sf*; *Distance* 26″.019; 1823.48.

No. CCLXXXVI. R. A. $18^h\ 56^m$; Decl. 4° 17′ S.

15 Aquilæ; H. C. 568; STRUVE, 603.

Large, white; small, bluish; 6 and 7 magnitudes.

June 15, 1823.
Five-feet Equatorial.
sp

Position. ° ′		Distance. Parts.	
63.54	S	113. 7	S
64.15	S	112. 3	S
63.41	S	112. 0	S
62.15	S	111. 5	S
63. 5	S	112. 0	S
64.15	H	113. 0	H
62.40	H	112. 9	H
63.20	H	113. 9	H
63. 5	H	114. 7	H
62.12	H	113. 0	H
Mean = 63.16		Mean = 112.90	
		Z = − 0.13	
		112.77	

Position = 63° 16′ *sp*
Distance = 35″615.

July 31, 1823.
Seven-feet Equatorial.
sp

Distance. Parts.	
145. 3	S
149. 9	S
153. 3	S
Mean = 149.50	
Z = − 1.31	
148.19	

Position = 63° 15′ *sp*. Single measures. S.
Distance = 35″.631.

H. C. 568; 15 Aquilæ; STRUVE, 603; continued.

No more measures can be procured; these however are good: the stars very steady, and on the meridian; suddenly become hazy. S.

Mean result.

Position 63° 16′ *sp*; *Distance* 35″.619; 1823.52.

No. CCLXXXVII. R. A. $18^h\ 58^m$; Decl. 6° 53′ N.

Very nearly equal; 7 and $7\frac{1}{4}$ magnitudes.

June 15, 1823.
Five-feet Equatorial.
n p

Position. ° ° ′		Distance. Parts.	
90—68. 5	S	26. 5	H
68.25	S	29. 5	H
67.15	S	27. 2	H
68.30	S	27. 5	H
68. 0	S	27. 0	H
66.50	H	26. 0	H
67.10	H	Mean = 27.28	
68. 0	H	Z = − 0.13	
67.30	H	27.15	
67.35	H		
Mean — 67.46			

Position = 67° 46′ *np*
Distance = 8″575. H.

June 19, 1823.
Five-feet Equatorial.
n p

Distance. Parts.	
29. 0	S
27. 0	S
27. 0	S
28. 2	S
29. 0	S
27. 0	S
Mean = 27.87	
Z = − 1.06	
26.81	

Distance = 8″.467. S.

Mean.

Position 67° 46′ *np*; *Distance* 8″.521; *Epoch* 1823.46.

No. CCLXXXVII. continued.

In STRUVE'S Catalogue this is set down as III. 109, but there is great room to doubt their identity. 1st, the place of III. 109, as deduced from that of 19 Aquilæ by the description in the Catalogue, differs 10′ in R. A. and as much in declination from that of the star here measured. 2dly, neither the positions nor distances agree, the measures of III. 109 being 22° 6′ *np*, distance 10″.22. If after all however it should really be the star, it must have undergone a very great change in angle, and a considerable one in distance.

No. CCLXXXVIII. R. A. $19^h\ 2^m$; Decl. 34° 18′ N.

H. C. 19; STRUVE, 609;

$6\frac{1}{2}$ and 8 magnitudes: large, yellow; small, purplish.

June 15, 1823.

Seven-feet Equatorial.

sp

Position. ° ′		Distance. Parts.	
10.22	S	71. 2	S
9.58	S	70. 0	S
11. 0	S	69. 8	S
10.35	S	70. 7	S
11.34	S	71. 0	S
9.45	H	73. 8	H
9. 5	H	72. 6	H
9.45	H	74. 1	H
10.20	H	73. 2	H
10.30	H	73. 0	S
		71. 0	H
Mean = 10.27		Mean = 71.95	
		Z = − 0.72	
		71.23	

Position = 10° 27′ *sp*

Distance = 17″.124.

CCLXXXIX. R. A. $19^h\ 6^m$; Decl. $38°\ 44'$ N. ±

Preceding η Lyræ;

Double; 9 and 10 magnitudes.

June 16, 1823.

Five-feet Equatorial.

nf

Position.		Distance Parts.	
° ′			
32.10	S	129. 3	S
33. 0	S	130. 3	S
32.37	S	129. 5	S
32.45	S	131. 5	S
33. 5	S	131. 5	S
Mean = 32.43		Mean = 130.42	

Position = 32° 43′ *nf*

Distance = 41″.136.

June 16, 1823.

Seven-feet Equatorial.

nf

Position.		Distance. Parts.	
° ′			
32. 0	H	161. 0	H
31.25	H	163. 0	H
31. 5	H	164. 5	H
31.30	H		
33.30	H		
Mean = 31.54		Mean = 162.83	
		Z = − 0.01	
		162.82	

Position = 31° 54′ *nf*

Distance = 39″.148.

Mean.

Position 32° 18′ *nf*; *Distance* 40″.391; *Epoch* 1823.46.

No. CCXC. R. A. $19^h\ 7^m$; Decl. $49°\ 31'$ N.

(6 Bode Cygni;) H. C. 358;

Very nearly equal; 6th magnitude.

June 6, 1823.

Five-feet Equatorial.

sp? H.

sp S.

Position.		Distance. Parts.	
° ′			
44.28	H	33. 2	H
43.15	H	34. 0	H
42.45	H	35. 1	H
43. 0	H	35. 3	H
44.50	H	31. 0	H
44.30	S	36. 6	S
44.25	S	36. 3	S
44.45	S	35. 3	S
44.50	S	35. 2	S
44.15	S	35. 1	S
Mean = 4.13		Mean = 34.71	
		Z = − 1.22	
		33.49	

Position = 44° 6′ *sp*

Distance = 10″.576.

1819.93; Position 46° 51′ *sp*; Struve, Dorpat. Obs. ii. p. 168. Obs. 166.

No. CCXCI. R. A. $19^h\ 8^m$; Decl. $38°\ 51'$ N.

η Lyræ; IV. 2 ? STRUVE, 612;

Third or fourth magnitude and tenth. The small star is blue; bears a very strong illumination, and is much improved by it.

June 16, 1823.
Five-feet Equatorial.
nf

Position.		Distance. Parts.	
° ′			
5.50	S	94. 3	H
5. 0	S	95. 8	H
5.50	S	95. 3	H
6.10	S	96. 5	H
5.20	S	96. 1	H
		96. 2	H
Mean = 5.38		Mean = 95.70	
		Z = − 0.17	
		95.33	

Position = 5° 38′ *nf*
Distance = 30″.107.

June 16, 1823.
Seven-feet Equatorial.
nf

Position.		Distance. Parts.	
° ′			
7. 5	H	120. 5	H
6.40	H	117. 3	H
6.36	H	120. 0	H
		119. 0	H
		117. 3	H
Mean = 6.31		Mean = 118.82	
		Z = − 0.01	
		118.81	

Position = 6° 31′ *nf*
Distance = 28″.566.

Mean.

Position 5° 58′ *nf*; *Distance* 29″.336; *Epoch* 1823.46.

Other measures are,

1782.31; Position 31° 51′ *sp*; Distance 25″.70; H. Catal. of 1782.
1819.90; 5 30 *nf*; STRUVE, Observationes, &c. Obs. 148, 160, 165.

The difference between Sir W. HERSCHEL's position and our own is so great, that it cannot be supposed we have measured the same star, especially since in four years, elapsed since M. STRUVE's observation, the relative position seems to have sustained no alteration.

No. CCXCII. R. A. $19^h\ 10^m$; Decl. $37^\circ\ 49'$ N.

θ Lyræ; VI. 56; Struve, 614;

Excessively unequal; 4 and 10 or 12 magnitudes; large, white; small, blue.

Position.	July 24, 1823.	Distance. Parts.
$18^\circ.40'$	Five-feet Equatorial.	327. 3
17.40	*nf*	330. 7
17.30 } S		323. 5 } S
16.45		325. 0
17.12	Position $= 17^\circ\ 33'$ *nf*	327. 5
Mean = 17.33	Distance $= 1'\ 42''.693$.	Mean = 326.80
		Z = − 1.64
		325.16

Small star scarcely bears any illumination; the measures very unsatisfactory.

Position.	July 31, 1823.	Distance. Parts.
$18^\circ.\ 5'$	Seven-feet Equatorial.	416. 8
17.35	*nf*	418. 5
18. 0		422. 5 } S
18.45 } S	4 and 15 magnitudes.	422. 3
18.10		420. 3
17.55	Position $= 18^\circ\ 7'$ *nf*	Mean = 420.08
Mean = 18. 7	Distance $= 1'\ 40''.690$.	Z = − 1.31
		418.77

During the last two measures of distance, the small star is become much brighter, and is of the 12th magnitude, but it bears very little illumination, and the measures of distance are extremely difficult.

θ Lyræ continued.

August 7, 1823.	August 9, 1823.
Five-feet Equatorial.	Seven-feet Equatorial.
Distance. Parts.	Distance. Parts.
323. 5	419. 2
328. 7	420. 7
331. 3 S	418. 3 S
329. 2	416. 3
327. 0	417. 7
Mean = 327.94	Mean = 418.44
Z = − 1.76	Z = − 1.44
326.18	417.00
Distance = 1′ 43″.015.	Distance = 1′ 40″.264.

Small star bears very little illumination.

Mean.

Position 17° 52′ *nf*; *Distance* 1′ 41″.665; *Epoch* 1823.67.

CCXCIII. R. A. $19^h\ 11^m$; Decl. 5° 16′ N.

H. C. 90; Struve, 616;

7 and 8½ magnitudes.

July 15, 1823.

Five-feet Equatorial.

np

Position.	Distance. Parts.
° ° ′	
90—1.35	100. 5
1.20	102. 8
2.12 S	102. 8 S
2. 5	101. 5
1.45	101. 7
Mean = 1. 47	Mean = 101.86
	Z = − 1.03
	100.83

Position = 88° 13′ *np*

Distance = 31″.844.

Stars on the meridian.

H. C. 90 continued.

Position.	August 9, 1823.	Distance. Parts.
° ° ′	Seven-feet Equatorial.	
90—2.15 ⎫	8 and $8\frac{3}{4}$ magnitudes.	129. 0 ⎫
2.47 ⎪	*n p*	132. 0 ⎪
3.15 ⎬ S		129. 8 ⎬ S
2.45 ⎪		129. 8 ⎪
2.25 ⎭	Position = 87° 19′ *np*	131. 2 ⎭
Mean — 2.41	Distance = 30″.997.	Mean = 130.36
		Z = — 1.44
		128.92

Small star does not bear a good illumination.

Mean.

Position 87° 46′ *np* ; *Distance* 31″.420 ; *Epoch* 1823.57.

No. CCXCIV. R. A. 19^h 18^m ; Decl. 9° 54′ S.

H. C. 111 ; STRUVE, 619 ;

$9\frac{1}{2}$ and $9\frac{3}{4}$ magnitudes ; scarcely bear any illumination in the five-feet.

Position.	July 24, 1823.	Distance. Parts.
° ° ′	Five-feet Equatorial.	
90—54.30 ⎫	*sf*	41. 2 ⎫
54.15 ⎪		40. 5 ⎪
55.45 ⎬ S		37. 1 ⎬ S
54.25 ⎪		34. 5 ⎪
53.55 ⎭	Position = 35° 26′ *sf*	37. 2 ⎭
Mean — 54.34	Distance = 11″.515.	Mean = 38.10
		Z = — 1.64
		36.46

Measures excessively difficult.

No. CCXCIV. continued.

Position.		Distance. Parts.
° ° ′	August 9, 1823.	
90—52. 0	Seven-feet Equatorial.	50. 0
54.10	*sf*	45. 8
54.50 S		48. 3 S
51.30		47. 5
55.30	Position = 36° 13′ *sf*	46. 7
54.40		Mean = 47.66
Mean — 53.47	Distance = 11″.113.	Z = — 1.44
		46.22

Stars on the meridian, and very steady; the night unusually favorable, but the measures excessively difficult.

Mean.

Position 35° 49′ *sf*; *Distance* 11″.314; *Epoch* 1823.58.

No. CCXCV. R. A. $19^h\ 19^m$; Decl. 20° 46′ N.

III. 57; STRUVE, 620;

$9\frac{3}{4}$ and 10th magnitudes; both bluish;

Position.		Distance. Parts.
° ° ′	July 15, 1823.	
90—26.35	*np* or *sf*	22. 9
26.40		23. 5
26.55 S	Five-feet Equatorial.	23. 0 S
25.12		22. 8
27.30	Position = 63° 26′ *np* or *sf*	24. 5
Mean — 26.34	Distance = 6″.938	Mean = 23.34
		Z = — 1.37
		21.97

A very difficult star, and will be best measured in the seven-feet. Several other stars in the field.

1783.20; *Position* 58° 36′ *sf*; *Distance* 7″.02; H. Cat. of 1785.

No. CCXCVI. R. A. $19^h\ 21^m$; Decl. 36° 10 N.

II. 69; STRUVE, 622;

As nearly equal as possible; each $9\frac{1}{2}$ magnitude; both bluish, and bear a very bad illumination.

July 15, 1823.

nf or *sp*

Five-feet Equatorial.

Position. ° ′		Distance. Parts	
24.35	S	24. 0	S
21. 0		23. 5	
22.27		26. 0	
21.56		25. 2	
22.14		23. 8	
Mean = 22.26		Mean = 24.50	
		Z = − 1.37	
		23.13	

Position = 22°26′ *nf* or *sp*

Distance = 7″.305.

August 9, 1823.

Seven-feet Equatorial.

Nearly equal; 9th mag.

nf or *sp*

Position. ° ′		Distance. Parts.	
23.55	S	31. 3	S
23.50		33. 2	
24.14		33. 3	
23.50		32. 7	
24.40		33. 8	
Mean = 24. 6		Mean = 32.86	
		Z = − 1.44	
		31.42	

Position = 24° 6′ *nf* or *sp*

Distance = 7″.555.

Measures very difficult; small star bears but a feeble illumination.

Mean

Position 23° 16′ *nf* or *sp*; *Distance* 7″.430; *Epoch* 1823.57.

In 1783 the position was measured at 29° 12′ *nf*, and therefore appears to have sustained a change.

No. CCXCVII. R. A. 19h 24m; Decl. 27° 35′ N.

β Cygni; V. 5; STRUVE, 623;

Pretty unequal; large, yellow; small, blue; colours very strongly contrasted.

June 27, 1822.
Five-feet Equatorial.
nf

Position = 34° 26′ *nf*
Distance = 34″.055.

Position. ° ′		Distance. Parts.	
34.42	S	111. 9	S
33.45	S	107. 5	S
33.47	S	106. 7	S
33.58	S	109. 0	S
34.22	S	109. 5	S
35.16	H	111. 0	S
34.55	H	110. 2	S
34.46	H	109. 0	S
34.10	H	108. 5	S
34.42	H	106. 9	S
		109. 6	H
		110. 3	H
		110. 9	H
		109. 6	H
		109. 0	H
Mean = 34.26		Mean = 109.31	
		Z = − 1.48	
		107.83	

June 18, 1823.
Seven-feet Equatorial.
4 and 6 magnitudes.
nf

Position = 35° 58′ *nf*
Distance = 34″.625

Position. ° ′		Distance. Parts.	
36.12	H	142. 0	H
36. 5	H	149. 0	H
36.45	H	145. 7	H
35. 0	H	145. 3	H
34.30	H	146. 4	H
36.31	H	141. 5	H
36.42	H		
Mean — 35.58		Mean = 144.98	
		Z = − 0.97	
		144.01	

β Cygni continued.

Position.		Distance. Parts.
° ′		
36.15		148. 5
35.30		147. 0
34.30	Position = 35° 34′ *nf*	146. 8
35.40 S	Distance = 35″.123.	146. 5 S
35.50		147. 0
36.15		146. 5
35. 0		
Mean = 35.34		Mean = 147.05
		Z = − 0.97
		146.08

Mean.

Position 35° 15′ *nf*; *Distance* 34″.383; *Epoch* 1822.98.

Other measures are,

1755.00;	32° 26′ *nf*;	34″.2;	BRADLEY, from Δ R A = 32″.5; Δ decl. 18″.3; as cited by STRUVE, ib.
1782.45;	Position 35 8 *nf*;	Dist. 34.83;	H. Catal. of 1782; and MS., each a mean of two very exact measures in 1781 and 1783.*
1800.00;	35 29 *nf*;	34.285;	PIAZZI, from Δ R A = 2ˢ.10, Δ decl. = 19″.9.
1816.90;	33 20 *nf*;		J. F. W. H. 2 measures, seven-feet reflector.
1819.60;	35 36 *nf*;	Dist. 35″.96;	STRUVE, Additam. 195.
1821.76;	35 30 *nf*;	34.29;	STRUVE, Dorp. Obs. iii.; ZACH iii. 524.
1823...;		33.11;	AMICI, Letter to ZACH. Corr. Ast. viii. 216.

* The measures taken by Sir WILLIAM HERSCHEL are, 39″ 32‴ (1781, Sep. 6), 35″ 2‴ very exact, full measure, 34″ 39‴ ditto ditto } 1783, February 5. The first only is given in the printed Catalogue, but the other two, taken afterwards, are obviously to be preferred. The angle here set down is a mean of the single measure 36 28 *nf* in the printed Catalogue, and another taken 1783, Feb. 5, *viz.* 33° 48′.

β Cygni continued.

Few stars are better determined than this, and few appear subject to less variation either in angle or distance. We may fairly regard our mean result as true to 0''.1 in distance, and $\frac{1}{2}$ a degree, or even less, in the angle. The angle of position deduced from the right ascensions and declinations of the stars at so early a period as BRADLEY's observations, cannot merit much reliance. The observations of 1816 by one of us, not at that time much practised in these delicate measurements, are not to be put in competition with the rest.

No. CCXCVIII. R. A. $19^h\ 34^m$; Decl. 8° 48' S.

Aquilæ 151 BODE; STRUVE, 629.

8 and $8\frac{1}{2}$ magnitudes.

Position.	August 28, 1823.	Distance. Parts.
° ° '	Five-feet Equatorial.	
90—33.35 } S	*sf*	307. 3 } S
33.41		307. 3
33.11		304. 0
33.17	Position = 56° 34' *sf*	307. 2
33.25		306. 5
Mean — 33.26	Distance = 1' 37''.112.	Mean = 306.46
		Z = + 1.03
		307.49

Stars on the meridian, but variable refraction troublesome.

No. CCXCIX. R. A. $19^h\ 37^m$; Decl. 50° 6′ N.

16 Cygni; V. 46; Struve, 633;

Equal; each of the 6th magnitude.

July 24, 1823.
Five-feet Equatorial.
np or *sf*

Position. ° ° ′	Distance. Parts.
90—44.30	119. 3
44.13	120. 6
44.29	122. 3
44.15	118. 9
44.21	121. 1
44.55	
S	S
Mean —44.27	Mean = 120.44
	Z = — 1.64
	118.80

Position = 45°33′ *np* or *sf*
Distance = 37″.520

July 31, 1823.
Seven-feet Equatorial.
Each 7 magnitude.
sf or *np*

Position. ° ° ′	Distance. Parts.
90—44.58	159. 5
45.30	160. 8
45.37	161. 8
45.20	159. 2
44.32	159 4
	153. 5
	159. 3
	154. 8
	153. 5
	154. 2
	154. 0
S	S
Mean — 45.11	Mean = 157.27
	Z = — 1.31
	155.96

Position = 44°49′ *sf* or *np*
Distance = 37″.498

M. Struve makes the angle of position of this star (Dorpat Obs. ii. 168. Obs. 169) 46° 36′ *sf*, agreeing well enough with our mean result, which is

Position 45° 13′ *sf* or *np*; *Distance* 37″.504; *Epoch* 1823.57.

16 Cygni continued.

M. STRUVE assigns 38″.5 as the distance in 1819. A computation, grounded on the differences of R. A. and declination, taken from BRADLEY's Catalogue in 1755, would give

1755. Position 50° 19′ *np* or *sf*: Distance 34″.561.

No. CCC. R. A. 19ʰ 38ᵐ; Decl. 33° 14′ N.

STRUVE, 634;

A very pretty double star; 9¾ and 10 magnitudes; bear a very good illumination.

Position.		
° ° ′		August 28, 1823.
90—36. 0	S	Seven-feet Equatorial.
34.35	S	*np*
35.10	S	
32.30	S	
32.45	S	
31.30	S	Position = 56°.15′ *np*
Mean — 33.45		

No. CCCI. R. A. 19ʰ 38ᵐ; Decl. 33° 14′ N.

Nova, prope STRUVII, 634ᵃᵐ.;

In the field with the last mentioned star (*i.e.* STRUVE, 634.)

Position.		
° ′		August 28, 1823.
15.45	S	Seven-feet Equatorial.
16.10	S	*nf*
15.25	S	
16.30	S	
15.55	S	Position = 15° 57′ *nf*
Mean 15.57		

Comes (of the 8th magnitude), *sf*.

90° — 32°.25′ = 57°.35′ *sf*. Distance 4 or 5 minutes.

Nova, prope STRUVII, 634[am], continued.

Position.		Distance. Parts.	
° ′	September 27, 1823.	110. 5	H
15.50	Seven-feet Equatorial.	111. 5	
	nf	111. 1	
		111. 9	
		110. 8	
	Position = 15° 50′ Single measure	Mean = 111.16	
	Distance = 23″.467.	Z = − 3.56	
		97.60	

Mean.

Position 15° 56′ *nf*; *Distance* 23″.467; *Epoch* 1823.70.

No. CCCII. R. A. $19^h\ 38^m$; Decl. 77° 52′ N.

H. C. 361; STRUVE, 635;

$6\frac{1}{2}$ and 7th magnitudes; Large, white; small, bluish.

Position.		Distance. Parts.	
° ′	July 24, 1823.		
70.10 S	Five-feet Equatorial.	41. 4	S
70.30	*nf*	39. 3	
67.20		38. 4	
68.20		39. 2	
67.45		41. 3	
Mean 68.49	Position = 68° 49′ *nf*	Mean = 39.92	
	Distance = 12″.089	Z = − 1.64	
		38.28	

Position.		Distance Parts.	
° ′	Seven-feet Equatorial.		
69.30 S	8 and 9 magnitudes.	47. 7	S
67.45	*nf*	49. 7	
67.10		52. 7	
68.30		50. 5	
68. 5		49. 5	
Mean = 68.12	Position = 68° 12′ *nf*	Mean = 50.02	
	Distance = 11″.784.	Z = − 1.01	
		49.01	

Mean.

Position 68° 30′ *nf*; *Distance* 11″.936; *Epoch* 1823.57.

No. CCCIII. R. A. $19^h\ 38^m$; Decl. $35° 39'$ N.
H. C. 16? STRUVE, 636;
7 and $7\frac{1}{2}$ magnitudes.

July 11, 1823.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
90°—52°. 8′	S	49. 2	S
54.45		48. 2	
51. 0		48. 0	
52. 7		50. 4	
52.27		48. 5	
Mean — 52.29		Mean = 48.86	
		Z = — 1.32	
		47.54	

Position = 37° 31′ *sf*
Distance = 15″.015.

July 31, 1823.
Seven-feet Equatorial.
Large, white; small, blue
6 and $6\frac{1}{2}$ magnitudes.
sf

Position.		Distance. Parts.	
90°—55°.10′	S	65. 9	S
54.45		64. 8	
52.50		63. 0	
53.45		65. 7	
54.30		64. 3	
Mean — 54.12		Mean = 64.74	
		Z = — 1.31	
		63.43	

Position = 35° 48′ *sf*
Distance = 15″.251

August 9, 1823.
Seven-feet Equatorial.
sf

Position.	
90°—52°. 0′	S
52.30	
52. 5	
54. 0	
53. 5	
Mean — 52.44	

Position = 37° 16′ *sf*

A third star C in view; 10th magnitude.

Measures of A. C.
sp

Position.		Distance. Parts.	
18°. 0′	S	582. 5	S
18.10		583. 5	
Mean = 18. 5		Mean = 583. 0	
		Z = + 1.44	
		581.56	

Position = 18°.5′ *sp*
Distance = 2′ 19″.831.

Mean. Position of A B 36° 52′ *sf*; Distance 15″.133; Epoch 1823.56.
A C 18 5 *sp*; 2′ 19″.831; 1823.60.

No. CCCIV. R. A. $19^h\ 39^m$; Decl. $44^\circ\ 42'$ N.

δ Cygni; I. 94; STRUVE, 637;

May 1, 1823.

Five-feet Equatorial.

Single; round, and exactly defined.

September 7, 1823.

Five-feet Equatorial.

Star on the meridian; examined it carefully; could not perceive the least appearance of elongation; the star perfectly round and admirably defined; night beautiful.

October 17, 1823.

A single lens, magnifying 578 times, applied to the five-feet equatorial, showed no elongation of this star. Night fine.

No. CCCV. R. A. $19^h\ 40'$; Decl. $33^\circ\ 20'$ N.

$\varkappa$ Cygni; IV. 11; STRUVE, 639;

Double; very unequal; large, white; small, dusky; does not bear a good illumination; a vast number of small stars in the field; 6 and 12 magnitudes. M. STRUVE calls them stars of the 5th and 8th magnitudes.

Position.			Distance. Parts.	
° ′				
15.51	S	June 27, 1822.	82. 2	S
16.40	S	Five-feet Equatorial.	81. 4	S
16.26	S	*nf*	82. 3	S
17.20	S		83. 0	S
15.37	S		83. 2	S
17.20	H		82. 4	H
17. 4	H		81. 9	H
16.13	H	Position = $16^\circ\ 42'$ *nf*	81. 0	H
17.34	H		83. 0	H
16.53	H	Distance = $25''.503$.	84. 0	H
Mean = 16.42			Mean = 82.44	
			Z = − 1.69	
			80.75	

1781.68; Position *nf*; Distance $24''.86$; H. Catalogue of 1782 and MS.

1819.93; $15^\circ\ 36'$ *nf*; STRUVE, Observationes, &c., p. 158, Obs. 167, 180.

No. CCCVI. R. A. $19^h\ 41^m$; Decl. $11^\circ\ 22'$ N.

π Aquilæ; I. 92; STRUVE, 640.

A very close double star, but distinctly separated with 240.

September 11, 1823 = 1823.70.

8 and 9 magnitudes.

sf

Position.	Distance. Parts.
° ° ′	
90—44.30	7. 0
46.35	8. 3
43.10	8. 0
44. 0 S	8. 7 S
44.18	9. 4
44.35	9. 0
44.40	
Mean 44.43	Mean = 8 .40
	Z = − 0.26
	8.14

Position = $45^\circ\ 27'$ *sf*

Distance = $1''.957$

Measures very good.

This star appears to have varied materially in its angle in the direction surmised by Sir W. HERSCHEL, whose measures stand as follows:—

1783.65; Position $34^\circ\ 24'$ *sf*; H. Catal. of 1785.
1802.72; 37 32 *sf*; Ditto. MS.

The average annual motion on the hypothesis of equal errors, in the two earlier observations, is $+ 0^\circ.314$.

No. CCCVII. R. A. $19^h\ 41^m$; Decl. $18^\circ\ 43'$ N.

ζ Sagittæ; II. 30; STRUVE, 641;

Extremely unequal; large, white; small, blue; bears but a slight illumination.

July 31, 1822.

Five-feet Equatorial.

np

Position.	Distance. Parts.
° ° ′	
90—40.10	26. 8
39.45	28. 3
39.20 S	29. 0
42. 5	30. 0 S
43. 0	29. 5
39. 0	28. 4
	29. 7
Mean — 40.33	Mean = 28.81
	Z = − 0.58
	28.23

Position = $49^\circ\ 27'$ *np*

Distance = $8''.915$.

ζ Sagittæ continued.

Position.		Distance. Parts.
° ° ′ 90—45.30 } S	August 19, 1823.	37. 5 } S
46.30	Seven-feet Equatorial.	36. 6
47.30	Large, white; small, blue.	37. 3
43.30	*np*	38. 8
44.10		38. 7
41. 0		
44.10	Position = 45° 23′ *np*	Mean = 37.78
		Z = — 1.67
Mean — 44.37	Distance = 8″.682.	36.11

"The measures are difficult, but the stars are extremely steady and well defined. Should the measures with the five-feet differ, these are to be preferred."

Position. (Mr. Richardson.)		Position.
° ° ′ 90—45.21	September 29, 1823.	° ° ′ 90—44.52 } S
46. 3	Seven-feet Equatorial.	45 20
46.36	*np*	46. 0
45.31		46.35
45.54		44.40
46.17		46.35
45.39	Position = 43° 57′ *np* (R.)	Mean — 45.40
47. 6	Position = 44° 20′ *np* S.	
Mean — 46. 3		

Night very favorable. R's observations taken when the stars were within 15 minutes east and west of the meridian; S's about half an hour after Mr. Richardson's were completed.

Mean result (rejecting the angles of July 31.)

Position 44° 32′ *np*; *Distance* 8″.818; *Epoch* 1823.69.

Other measures are,

1781.88; Position 34° 10′ *np*; Distance 8″.83, inaccurate. H. Catal. of 1782. Corrected by reference to MS. the distance being wrong cast up. The position is stated to be liable to considerable error on account of obscurity.

1802.45; 40° 41′ *np*; H. MS.

1819.74; 39 32 *np*; Struve, Dorp. ii. Observationes 98, 102, 129. The discrepancy between this result and that of our measures is very extraordinary; and is the more to be lamented as these stars form, perhaps, a binary system.

No. CCCVIII. R. A. $19^h\ 42^m$; Decl. $8°\ 24'$ N.

α Aquilæ, VI. 46; STRUVE, 642;

Excessively unequal.

August 15, 1822.
Seven-feet Equatorial.

Position.

° ° ′	
90—33.16	S
32.50	S
32.28	S
33. 2	S
34. 8	S
33.12	S
34. 0	S
34.20	S
33. 6	S
33.50	S

Mean — 33.25

np

Position = 56° 35′ *np*
Distance = 2′.33″.434

August 19, 1822
Seven-feet Equatorial.

Distance.
Parts.

639. 0	S
641. 0	S
639. 5	S
638. 2	S
636. 5	S
637. 5	S
637. 8	S
638. 9	S
639. 0	S
637. 5	S

Mean = 638.49
Z = — 0.36

638.13

Position.

° ° ′	
90—35.45	S
34.20	S
34.30	S
34.30	S
35.40	S
35.10	S
34.20	H
35.48	H
36. 0	H
34.58	H
34. 1	H
34.32	H

Mean — 34.58

August 12, 1823.
Seven-feet equatorial.

np

Position = 55°.2′ *n p*
Distance = 2′ 33″.256. H.

Distance.
Parts.

641. 0	H
638. 5	H
636. 4	H
640. 0	H
640. 3	H

Mean = 639.24
Z = — 1.85

637.39

α Aquilæ continued.

The measures of this star in order of time are,

1781.83;	Position 64° 44′ *np*;	Distance 2′ 23″.3;	H. Catal. of 1785.
1819.71;	57 8 *np*;	2 19 .1;	STRUVE, Additam. 196.
1821.85;	Position 56° 6 *np*;	2 33 .71;	STRUVE, Dorpat Obs. iii. vide ZACH viii. 524, &c. from Δ decl. = 127″.58, 10 Obs.
1823.11;	55 48 *np*;	2 33 .375;	H and S. Mean result.

As it is not possible to commit an error of 8° in the position of a star at the distance of 2′½, the relative motion of these stars is past a doubt. The proper motion of α is not sufficient to account for it, for this is such as would alone carry it almost directly towards the small star with a velocity of 0″.634 per annum. Were the small star at rest then, the large one should have approached it by 26″.63, with a variation of the angle of position of not more than two or three degrees, and that in a contrary direction to what has actually happened. To account for the phænomena, if the proper motion assigned to α be correct, the small star must have a motion nearly in the same direction as α, and somewhat more rapid.

No. CCCIX. R. A. $19^h\ 45^m$; Decl. 8° 42′ S.

57 Aquilæ; IV. 14; STRUVE, 646.

Both bluish; 6 and 6½ magnitudes.

July 24, 1823.

Five-feet Equatorial.

sf

Position.	Distance. Parts.
° ° ′	
90—9.24	114. 4
8.50	116. 8
8.57 (S)	114. 6 (S)
8.57	116. 5
9. 5	115. 8
Mean — 9. 3	115.62
	z = — 1.64
	113.98

Position = 80° 57′ *sf*

Distance = 35″.997.

57 Aquilæ continued.

Position.		Distance. Parts.
90°—8°.58′	August 19, 1823.	153. 5
8.40	Seven-feet Equatorial.	152. 5
8.35 S	6 and $6\frac{1}{4}$ magnitudes.	153. 0 S
8.15	*sf*	153. 3
8.50		151. 3
Mean — 8.40	Position = 81° 20′ *sf*	Mean = 152.27
	Distance = 36.″319.	Z = — 1.67
		151.05

Mean.

Position 81° 8′ *sf.* *Distance* 36″.158; *Epoch* 1823.60.

Other measures are,

1781.83;	Position 81° 55′ *sp*;	Distance 29″. 46;	H. Cat. of 1782.
1819.71;	78 *sf*;	20 681;	STRUVE; computed from Δ R A = 0°.29, and Pos. 78° *sf*; Dorp. Obs. Addit. ii. 196.
1821.79;	81 48 *sf*;	36 200;	STRUVE; Dorpat Obs. iii. 1821, Oservationes 5, 35.

M. STRUVE's distance of 1819 being computed from a small difference of R. A. and a great angle of position, can lay no claim to confidence. The position has changed materially, no less than 16° 57′ in 41.77 years; or — 0°.405 per annum; unless *sf* be to be read for *sp* in the observation of 1781.

No. CCCX. R. A. 19° 45′; Decl. 19° 53′ N.

STRUVE, 647.

Position.		Distance. Parts.
90°—31°. 5′	August 16, 1823.	134. 2
31.12	Five-feet Equatorial.	139. 0
31. 6 S	6 and 7 magnitudes.	S 133. 0
32. 0	*sf*	132. 5
31.15		137. 5
		134. 8
Mean — 31.20	Position=58°.40′ *sf*	Mean = 135.17
	Ditance=41″.944	Z = — 2.36
	Stars blotty.	132.81

STRUVE, 647; continued.

August 19, 1823.
Seven-feet Equatorial.
6 and $6\frac{1}{4}$ magnitudes.
sf or *np*

Position.		Distance. Parts.	
$90^\circ - 31^\circ.50'$	S	183. 2	S
30.58		178. 3	
32.15		180. 2	
31.30		180. 7	
31.45		178. 3	
Mean — 31.40		Mean = 180.14	
		Z = — 1.67	
		178.47	

Position = $58^\circ\ 20'$ *sf* or *np*
Distance = $42''.911$

Mean.

Position $58^\circ\ 30'$ *sf* or *np*; *Distance* $42''.427$; *Epoch* 1823.63.

In M. STRUVE's Catalogue the star here observed is called III. 105, but does not in any respect agree with that star which is stated in the Catalogue to have its angle $50^\circ\ 24'$ *sp* and distance $14''\ 29'''$.

No. CCCXI. R. A. $19^h\ 49^m$; Decl. $69^\circ\ 48'$ N.

ϵ Draconis; I. 8; STRUVE, 650;

July 15, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
$90^\circ - 6^\circ.33'$	S	10. 0	S
4.22		8. 8	
4.25		8. 4	
6.24		9. 2	
4.30		9. 8	
		10. 3	
		10. 5	
Mean — 5.15		Mean = 9.57	
		Z = — 1.37	
		8.20	

Position = $84^\circ 45'$ *np*
Distance = $2''.590$.

August 12, 1823.
Seven-feet Equatorial.
5 and 10 magnitudes.
np

Position.	
$90^\circ - 2^\circ.\ 0'$	H
6. 0	
3. 0	
Mean — 3.40	

Position = $86^\circ\ 20'$ *np*
Distance = $3''.000$ by estimation.

ε Draconis continued.

Mean.

Position 85° 21′ *np* ; *Distance* 2″.590 ; *Epoch* 1823.58.

Other measures are,

1781.81 ; Position 63° 14′ *np* ; H. Account of Changes, &c.
1804.39 ; 84 29 *np* ; ditto.

The supposed motion of the small star is not verified. If the observations of 1804 and 1823 be correct, that of 1781 cannot be so; and *vice versa*, if the latter be correct, a great error must exist in one or both of the others. The measures are of the utmost difficulty. Our observations were each made without the others knowledge, and neither observer thought the slightest confidence could be placed in his measures, it being even uncertain whether the small star had really been seen at all, or in lieu of it some optical illusion. The agreement of the results with different instruments however is a great proof of their reality.

No. CCCXII. R. A. $19^h\ 51^m$; Decl. 51° 58′ N.

ψ Cygni.

Large, white ; small, decidedly blue.

September 8, 1823.

Seven-feet Equatorial.

5 and 10 magnitudes.

s p

Position. ° ′		Distance. Parts.	
87.50	S	22. 0	S
86.55	S	22. 2	S
86.55	S	19. 8	S
87.10	S	21. 3	S
87.30	S	20. 3	S
89. 5	S		
86.43	S		
Mean = 87.27		Mean = 21.12	
		Z = − 1.49	
		19.63	

Position = 87° 27′ *s p*
Distance = 4″.719.

ψ Cygni continued.

Position.		Distance. Parts.
° ′	Five-feet Equatorial.	
87.10 S	*sp*	14. 0 S
86.35 S		13. 4 S
87.30 S		12. 4 S
87.30 S		13. 7 S
86.45 S	Position = 87° 6′ *sp*	13. 5 S
Mean = 87. 6	Distance = 3″.998	Mean = 13.40
		Z = − 0.74
		12.66

Stars 2¼ west of meridian, and the small one very indistinct.

Position.	September 9, 1823.	Distance. Parts.
° ′	Five-feet Equatorial.	
89.20 S	*sp*	15. 5 S
89. 0 S		14. 1 S
89.40 S		14. 2 S
89.25 S		14. 0 S
89.30 S		15. 6 S
89.35 S	Position = 89° 25′ *sp*	15. 4 S
Mean = 89.25	Distance = 4″.245.	Mean = 14.80
		Z = − 1.36
		13.44

Stars on the meridian. These measures are decidedly to be preferred to those taken last night with the Five-feet.

Mean.

Position 88° 0′ *sp* ; *Distance* 4″.321 ; *Epoch* 1823.65.

Other measures are,

1779.89; Position 89° 32′ *sp*; H. Catal. of 1782, corrected by reference to the MS. *np* being printed for *sp*.

1802.01; 86 54 *sp*; H. MS.

1819.—; 90 ± *sp*; Struve, Addit. 196.

No. CCCXIII. R. A. $19^h\ 56^m$; Decl. $35°\ 32'$ N.
I. 96; STRUVE, 656.
Triple; A = 8th, B = 9th, C = 9th magnitudes.

Measures of AB.
August 14, 1823.
Five-feet Equatorial.
sf

Position.		Distance. Parts.	
° ° ′			
90—3.55	H	11. 0	H
6.20	H	8. 0	H
2.45	H	9. 0	H
0. 0	H	10. 0	H
1.30	H	10. 0	S
2.25	H	10. 5	S
2. 5	S	11. 3	S
3.35	S	10. 3	S
4. 0	S	Mean = 10.01	
3.51	S	Z = — 2.20	
3.33	S	7.81	
3.42	S		
Mean — 3. 8			

Position = 86° 52′ *sf*
Distance = 2″.467.

August 14, 1823.
Measures of AC.
Five-feet Equatorial.
np

Position.		Distance. Parts.	
° ° ′			
90—30.15	S	132. 7	S
30.22	S	134. 0	S
30.45	S	131. 0	S
30.30	S	137. 0	S
30. 0	S	134. 7	S
32.40	H	134. 0	S
28.30	H	131. 5	H
30.25	H	130. 3	H
31.15	H	131. 2	H
30.30	H	137. 0	H
Mean — 30.31		132. 0	H
		131. 6	H
		Mean = 133.08	
		Z = — 2.20	
		130.88	

Position = 59° 29′ *np*
Distance = 41″.335.

The small star bears but a feeble illumination.

Sir W. HERSCHEL'S measures are as follows :—

1783.73; Position of AB 89° 18′ *sf*; (H. Catal. of 1785. Printed *np*, but corrected by reference to the MS.

AC 56 3 *np*; Ditto. Ditto.

No. CCCXIV. R. A. $19^h\ 59^m$; Decl. $35^\circ\ 18'$ N.

H.C. 16; STRUVE, 658;

About this place are four double stars very near to each other; if the brightest or northern pair be brought to the lower part of the field, all the others will be in view.

Measures of AB. R. A. $20^h\ 0^m$; Decl. $35^\circ\ 18'$ N.

the Bright pair.

Five-feet Equatorial.

nf

Position.		Distance. Parts.
$62^\circ.\ 0'$		124. 3
62.25		123. 8
61.30 S		123. 0 S
62.15		124. 5
62.10	Position = $62^\circ\ 4'$ *nf*	123. 4
Mean = 62. 4	Distance = $38''.581$.	Mean = 123.80
		Z = − 1.64
		122.16

July 31, 1823.

Seven-feet Equatorial.

Measures of AB.

nf

Position.		Distance. Parts.
$62^\circ.20'$		157. 0
61.28		154. 6
60.52 S		154. 0 S
61.25		155. 7
61.35	Position = $61^\circ\ 32'$ *nf*	154. 3
Mean = 61.32	Distance = $36''.981$.	Mean = 155.12
		Z = − 1.31
		153.81

This star however is triple; a small blue star K, is *np* of A, and is of the 12th magnitude.

H. C. 16 continued.

August 7.	August 20.	August 20, 1823.
Five-feet Equatorial.	Seven-feet Equatorial.	Five-feet Equatorial.
Distance. Parts.	Distance. Parts.	Distance. Parts.
114. 0	154. 0	113. 8
116. 2	154. 7	116. 7
120. 2 S	154. 6 S	116. 0 S
118. 0	153. 8	113. 9
118. 0	152. 8	113. 4
Mean = 117.28	Mean = 153.98	Mean = 114.76
Z = − 1.76	Z = − 2.44	Z = − 0.17
115.52	151.54	114.59
Distance = 36″483.	Distance 36″.437.	Distance = 36″190.

Position.

° ° ′
90—58.20 S
59.45
Mean — 59. 2

July 31, 1823.

Measures of AK.

Seven-feet Equatorial.

np

Position = 30° 58′ *np*

Distance = 10″.793 ±.

Distance. Parts.

46. 0±
46. 4±
Mean = 46.20
Z = − 1.31
44.89±

The night too hazy for accurate measures of this delicate star.

Mean.

Position of AB 61° 48′ *nf*; *Distance* 36″.523; *Epoch* 1823.58.

AK 30 58 *np*; 10 .793.

No. CCCXV. R. A. $19^h\ 59^m$; Decl. $35°\ 17'$ N.

1^{ma} Nova prope H. C. 16.

Measures of C D; R. A. $20^h\ 0^m$; Decl. $35°\ 17'$.

Large, white; small, blue; 7th and 9th magnitudes.

July 31, 1823.
Seven-feet Equatorial.
s p

Position.	Distance.
° ′	Parts.
33.25	81. 4
33.35	82. 2
33.15	80. 7
33.35	81. 8
33.37	83. 3
34. 0	
Mean = 33.34	Mean = 81.88
	Z = − 1.31
	80.57

Position = 33° 34′
Distance = 19″.372.

Stars very steady, but the weather extremely hazy.

August 7, 1823.
Five-feet Equatorial.
8 and 9 magnitudes.
s p

Position.	Distance.
° ′	Parts.
33.25	67. 0
33.30	67. 3
34.15	68. 8
33.15	67. 3
33. 7	68. 0
Mean = 33.30	Mean = 67.60
	Z = − 1.76
	65.92

Position = 33° 30′ *s p*
Distance = 20″.818.

Small star does not bear a good illumination; night unfavourable; observation unsatisfactory.

August 20, 1823.
Seven-feet Equatorial.
sp

Position.	Distance.
° ′	Parts.
33.40	84. 3
33. 3	85. 7
33.25	89. 0
32.40	86. 7
33.42	88. 3
Mean = 33.18	Mean = 86.80
	Z = − 2.44
	84.36

Position = 33° ′18 *sp*
Distance = 20″.283

No. CCCXV. continued.

Position.		Distance. Parts.
° ′	Five-feet Equatorial.	
33. 5	$9\frac{1}{2}$ and 10 magnitudes.	64. 6
32.10	*s p*	63. 8
34. 7 } S		64. 7 } S
34. 5		62. 7
33.30		64. 6
Mean = 33.23	Position = 33° 23′ *sp*	Mean = 64.08
	Distance = 20″.184	Z = − 0.17
		63.91

Mean.

Position of C D ; 33° 26′ *sp* ; *Distance* 20″.164 : *Epoch* 1823.61.

No. CCCXVI. R. A. $20^h\ 0^m$; Decl. 35° 7′ N.

2^{da} Nova prope ; H. C. 16.

August 7, 1823.

Measures of G. H.

Position.		
° ° ′	Five-feet Equatorial.	Night unfavourable ; Observations unsatisfactory.
90—34.40	7 and 8 magnitudes.	
36.15	*np*	
35.40		
35.35		
35.30		
Mean — 35.32	Position = 54° 28′ *np*	

Position.		Distance. Parts.
° ° ′	August 20, 1823.	
90—36.10	Seven-feet Equatorial.	292. 7
36.33	8 and 9 magnitudes.	291. 3
36.30 } S	*n p*	290. 1 } S
36.45		289. 3
35.45		289. 2
Mean — 36.21	Position = 53° 39′ *np*	Mean = 290.52
	Distance = 1′ 9″.267.	Z = − 2.44
		288.08

2^{da} Nova prope; H. C. 16; continued.

Five-feet Equatorial.
8 and 10 magnitudes.
np

Distance = 1′ 9″.691.

Distance. Parts.	
220. 8	S
220. 8	
220. 2	
222. 3	
220. 1	
Mean = 220.84	
Z = − 0.17	
220.67	

Measures good, but the small star is faint.

Mean.

Position of G. H.; 54° 3′ *np*; *Dist.* 1′ 9″.479; *Epoch* 1823.62.

No. CCCXVII. R. A. $20^h\ 3^m$; Decl. 0° 19′ N.

II. 96; STRUVE, 662;

As nearly equal as possible; 7th magnitude.

August 16, 1823.
Five-feet Equatorial.
nf or *sp*

Position = 61° 39′ *nf* or *sp*
Distance = 4″.087.

Position. ° ′		Distance. Parts.	
60.10	S	14. 0	S
62.33		15. 3	
60.30		15. 3	
62.45		15. 6	
62.16		16. 3	
Mean = 61.39		Mean = 15.30	
		Z = − 2.36	
		12.94	

September 1, 1823.
Seven-feet Equatorial.
7 and 7 magnitudes.
sp
Very nearly equal.

Position = 61° 58′ *sp*
Distance = 4″.113.

Position. ° ′		Distance. Parts.	
61.45	H	16. 2	S
62.36		17. 9	
60.20		14. 1	
61.40		16. 8	
63.30		15. 7	
Mean = 61.58		Mean = 16.14	
		Z = + 0.97	
		17.11	

II. 96 ; Struve, 662 continued.

Mean.

Position 61° 48′ *sp* ; *Distance* 4″.100 ; *Epoch* 1823.65.

Other measures are,

1783.70;	Position 56° 12′ *sp*;	H. Catalogue of 1782.
1802.76;	57 55 *sp*;	H. MSS.
1821.82;	61 51 *sp*;	Distance 3″.862 from △ decl. 3″405; Struve, Dorp. Obs. iii. pp. 140. Obs. 41 and 52.

A very slow change of angle may be suspected in this star.

No. CCCXVIII. R. A. $20^h\ 6^m$; Decl. 4° 2′ S.

H. C. 182 ; Struve, 665 ;

7 and 9 magnitudes ; large, white ; small, blue.

August 16, 1823. Five-feet Equatorial. *sp*

Position ° ′		Distance. Parts.	
34.50	S	46. 7	S
36.25	S	50. 3	S
38.25	S	49. 0	S
36.10	S	47. 5	S
37.12	S	48. 7	S
37.40	S		
Mean = 36.47		Mean = 48.44	
		Z = − 2.36	
		46.08	

Position = 36° 47′ *sp*
Distance = 14″.553.

September 1, 1823. Seven-feet Equatorial. 7 and 8 magnitudes. *sp*

Position. ° ′		Distance. Parts.	
37.20	H	58. 9	H
36.28	H	58. 4	H
35.35	H		
36.40	H		
35.15	H		
Mean = 36.16		Mean = 58.65	
		Z = + 0.97	
		59.62	

Position = 36° 16′ *sp*
Distance = 14″.335.

It suddenly became cloudy ; no more distances could be procured.

Mean.

Position 36° 33′ *sp* ; *Distance* 14″.491 ; *Epoch* 1823.64.

No. CCCXIX. R. A, $20^h\ 8^m$; Decl. 13° 3′ S.

α Capricorni; STRUVE, 666;

Unequal; 5 and 6 magnitudes.

July 30, 1822.
Five-feet Equatorial.
np

Position. ° ° ′		Distance. Parts.	
90—68.50	S	1178. 5	S
68.35	S	1180. 8	S
68.30	S	1179. 5	S
68.36	S	1178. 0	S
68.38	S	1179. 1	S
68.31	H	1181. 0	H
68.30	H	1183. 6	H
68.26	H	1184. 0	H
68.29	H	1183. 2	H
68.35	H	1181. 5	H
Mean — 68.34		Mean = 1180.92	
		Z = — 0.12	
		1181.04	

Position = 21° 26′ *np*
Distance = 6′ 12″.999.

No. CCCXX. R. A. $20^h\ 14^m$; Decl. 54° 48′ N.

I. 95; STRUVE, 672;

Double; 6 and $8\frac{1}{2}$ or 9 magnitudes.

June 6, 1823.
Five-feet Equatorial.
np

Position. ° ° ′		Distance. Parts.	
90—22.50	S	14. 0	S
21.20	S	13. 8	S
23.15	S	13. 5	S
22.35	S	12. 8	S
20.35	S	12. 9	S
Mean — 22. 7		Mean = 13.40	
		Z = — 1.22	
		12.18	

Position = 67° 53′ *np*
Distance = 3″.847.

I. 95; STRUVE, 672 continued.

June 6, 1823.
Seven-feet Equatorial.
np

Position.		Distance. Parts.	
° ° ′			
90—19.50	S	18. 2	S
21.30		16. 3	
23. 0		19. 0	
20.15		18. 2	
20.30		18. 0	
19.30			
Mean — 20.46		Mean = 17.94	
		Z = — 0.38	
		17.56	

Position = 69° 14′ *np*
Distance = 4″.221.

June 6, 1823.
Seven-feet Equatorial.
np
5 and 8 magnitudes. H.

Position.		Distance. Parts.	
° ° ′			
90—20. 5	H	17. 0	H
19.30		15. 8	
17.30		16. 0	
17.10		16. 5	
16. 0		17. 1	
19.30			
17.35			
Mean — 18.11		Mean = 16.48	
		Z = — 0.38	
		16.10	

Position = 71° 49′ *np*
Distance = 3″.871

Mean.

Position 69° 39 *np*; *Distance* 3″.980; *Epoch* 1823.46.

1783.73; Position 72° 15′ *np*; H. Catal. of 1785.

1792.71; Position about 75° *np*; Ditto. MS.

No. CCCXXI. R. A. 20h 15m; Decl. 77° 10′ N.

κ Cephei; III. 70; STRUVE, 673;

Large, white; small, blue.

September 9, 1823.
Five-feet Equatorial.
5 and 10 magnitudes.
sf

Position.		Distance. Parts.	
° ° ′			
90—55.25	S	26. 5	S
54. 0		25. 6	
52.20		23. 1	
52.30		24. 9	
55.20		25. 7	
Mean — 53.55		Mean = 25.16	
		Z = — 1.36	
		23.80	

Position = 36° 5′ *sf*
Distance = 7″.517.

κ Cephei continued.

Stars within a few minutes of the meridian; set the micrometer to 20 parts, which, with zero, are equal to 6″, and therefore greater than Sir W. H's measure; and the small star was decidedly without the wire.

Position.	September 9, 1823.	Distance. Parts.
° ° ′	Seven-feet Equatorial.	
90—51.45 ⎫	*sf*	38. 4 ⎫
52.10 ⎪		37. 8 ⎪
51.28 ⎬ S		37. 2 ⎬ S
50.48 ⎪	Position = 38° 25′ *sf*	36. 5 ⎪
51.45 ⎭	Distance = 8″.621.	36. 5 ⎭
Mean — 51.35		Mean = 37.28
		Z = — 1.42
		35.86

Stars $2\frac{1}{2}$ hours west of meridian.

Position.	September 10, 1823.	Distance. Parts.
° ° ′	*sf*	35. 0 ⎫
90—49. 0 ⎫	Seven-feet Equatorial.	33. 2 ⎪
48.30 ⎬ S		35. 9 ⎬ S
50.10 ⎭		34. 8 ⎪
Mean — 49.13	Position = 40° 47′ *sf*	34. 5 ⎭
	Distance = 8″.276.	Mean = 34.68
		Z = — 0.26
		34.42

Stars one hour and twenty minutes west of meridian; the measures are good.

Mean.

Position 38° 4′ *sf*; *Distance* 8″.138; *Epoch* 1823.70.

Other measures are,

1783.19;	Position 32° 30′ *sf*;	Distance 5″.28;	H. Cat. of 1785.
1804.10;	34 31 *sf*;	D°. MSS.;	mean of three measures.
1820.18;	36 12 *sf*;	Distance 7″.08;	STRUVE, Addit. ii. p. 196.
1821.18;	39 4 *sf*;	D°.	Dorpat Obs. iii. p. 135, Obs. 3.

The distance is evidently much increased.

No. CCCXXII. R. A. 20^h 19^m; Decl. 18° 24′ S.

ρ Capricorni; VI. 29;

The distant pair AC.

Position.	Five-feet Equatorial.	Distance. Parts.
° ° ′	*sf*	
90—29. 5 ⎫	5 and 7 magnitudes.	754. 3 ⎫
29.47 ⎪		755. 5 ⎪
29.35 ⎬S		756. 4 ⎬S
29.32 ⎪		755. 0 ⎪
29. 0 ⎭		754. 0 ⎭
Mean — 29.24	Position = 60° 36′ *sf*	Mean = 755.02
	Distance = 3′ 58″.596.	Z = + 0.46
		755.48

Position.	Measures of AC. Seven-feet Equatorial.	Distance. Parts.
° ° ′	*sf*	
90—29.25 ⎫		991. 2 ⎫
30. 2 ⎪		992. 5 ⎪
30.20 ⎬S		990. 7 ⎬S
29.50 ⎪		989. 2 ⎪
29.39 ⎭		991. 1 ⎭
Mean — 29.51	Position = 60° 9′ *sf*	Mean = 990.94
	Distance = 3′ 57″.446	Z = — 3.42
		987,52

Mean.

Position 60° 45′ *sf*; *Distance* 3′ 58″.021; *Epoch* 1823.78.

M. STRUVE makes the angle 60° 54′ *sf*; agreeing perfectly with our own.

CCCXXIII. R. A. $20^h\ 20^m$; Decl. $18° 24'$ S.

ρ Capricorni; II. 51; STRUVE, 676;

5 and 10 magnitudes.

Seven-feet Equatorial.

sf

Measures of AB.

Position.	Distance. Parts.
° ° ′	
90—3. 0	23. 8
2.15	24. 8
4.45	25. 3
4.20	23. 7
4.40	22. 8
S	S
Mean — 3.48	Mean = 24.08
	Z = — 2.98
	21.10

Position $= 86° 12'$ *sf*

Distance $= 5''.073$.

Variable refraction excessively troublesome, and half the object-glass covered by the shutter of the observatory. The distances are extremely doubtful. Measures taken when the star was ½ an hour west of the meridian.

October 11, 1823.

Five-feet Equatorial.

Measures of AB.

Large, white; small, blue

sf

Position.	Distance. Parts.
° ° ′	
90—1. 0	12. 0
1.15	13. 0
1.45	11. 8
2.30	12. 5
2.12	13. 3
4. 0	
S	S
Mean — 2. 7	Mean = 12.52
	Z = + 0.46
	12.98

Position $= 87° 53'$ *sf*

Distance $= 4''.099$.

Measures extremely difficult, although the stars are beautifully defined, and on the meridian.

ρ Capricorni continued.

Seven-feet Equatorial.

Measures of AB

s f

Position.	Distance. Parts.
° ′	
90—3.30 S	21. 0 S
3. 0	18. 3
1.45	20. 2
1.30	20. 9
2.35	18. 9
2.10	
2.37	
Mean — 2.27	Mean = 19.86
	Z = — 3.42
	16.44

Position = 87° 33′ *sf*

Distance = 3″.953.

Measures extremely difficult.

Mean.

Position 87° 17′ *sf*; *Distance* 4″.026; *Epoch* 1823.78.

In taking the mean the distances of the first set are rejected.

Other measures are,

1783.51; Position 84° 0′ *sf*; } H. Account of Changes, &c.
1802.66; 86 55 *sp*; }
1819.73; 85 48 *sf*; STRUVE, Dorpat Obs. ii. p. 166, Obs. 115.

In the observations of 1802 *sp* has evidently been set down by mistake for *sf*; and the star, granting this, has sustained no change.

No. CCCXXIV. R. A. $20^h 20^m$; Decl. $19° 10'$ S.

o, 12 Capricorni; IV. 71; STRUVE, 677.

Position.	September 11, 1823.	Distance. Parts.
° ′	Five-feet Equatorial.	
30. 5		69. 5
30.50	6 and 7 magnitudes.	68. 5
30.27 S	*sp*	69. 4 S
30. 0		70. 2
30. 0		71. 0
Mean = 30.16	Position = 30° 16′ *sp*	Mean = 69.72
	Distance = 21″.823.	Z = − 0.62
		69.10

Stars very steady; measures extremely satisfactory.

Position.	October 1, 1823.	Distance. Parts.
° ′	Seven-feet Equatorial.	
30.10		92. 3
30.35	7 and $7\frac{1}{2}$ magnitudes.	97. 6
30. 5 S	*sp*	96. 7 S
30.15		93. 8
30.25		95. 7
		96. 8
Mean = 30.18	Position = 30° 18′ *sp*	Mean = 95.48
	Distance = 22″.246.	Z = − 2.96
		92.52

Stars on the meridian, and very steady.

Mean.

Position 30° 17′ *sp*; *Distance* 22″.060; *Epoch* 1823.73.

Other measures are,

1783.62; Position 30° 45′ *sp*; Distance 23″.50; H. Cat. of 1785.
1821.85; 32 30 *sp*; STRUVE, Dorp. Obs. iii, 140, Obs. 36 and 72.

No. CCCXXV. R. A. 20^h 23^m; Decl. 10° 35′ N.

H. C. 109; STRUVE, 680.

A little unequal; 8 and 8½ magnitude; bears a good illumination.

July 30, 1822.
Five-feet Equatorial.
sp

Position = 14° 22′ *sp*
Distance = 15″.484.

Position. ° ′		Distance Parts.	
16.10	S	48. 1	S
13. 0	S	48. 5	S
13.50	S	49. 0	S
14.30	S	48. 8	S
14.20	S	49. 0	S
15. 0	S	50. 0	H
14.54	H	49. 4	H
15. 7	H	49. 2	H
13.40	H	48. 6	H
13.35	H	48. 5	H
14. 1	H		
Mean = 14.22		Mean = 48.91	
		Z = + 0.12	
		49.03	

No. CCCXXVI. R. A. 20^h 32^m; Decl. 38° 5′ N.

(Nova);

8th and 12th magnitudes; large, white; small, blue.

September 1, 1823.
Five-feet Equatorial.
nf

Position = 87° 40′
Distance = 9″.646.

Position. ° ′		Distance. Parts.	
87.30	H	29. 8	H
87.10	H	31. 0	H
88.40	H	31. 8	H
88.30	H	31. 5	H
86.30	H	31. 1	H
Mean = 87.40		Mean = 31.04	
		Z = − 0.50	
		30.54	

No. CCCXXVI. continued.

September 7, 1823.

Five-feet Equatorial.

Large, white; small, blue.

8 and 12 magnitudes.

np

Position.		Distance. Parts.	
° ° ′			
90—1. 45	S	30. 0	S
1 .45	S	29. 0	S
0. 54	S	30. 2	S
1. 24	S	31. 4	S
0. 15	S	31. 3	S
1. 42	S		
Mean — 1.17		Mean = 30.38	
		Z = — 0.37	
		30.01	

Position = 88° 43′ *np*

Distance = 9″.478.

Mean.

Position 89° 29′ *nf*; *Distance* 9″.562; *Epoch* 1823.68.

No. CCCXXVII. R. A. $20^h\ 38^m$; Decl. 15°.29′ N.

γ Delphini; III. 10; STRUVE, 694;

Large, white; small, yellowish; difference of colours decided, but not great.

September 6, 1823.

Five-feet Equatorial.

5½ and 6½ magnitudes.

n p

Position.		Distance. Parts.	
° ° ′			
90—84.45	S	38. 1	S
85.48	S	39. 0	S
85.50	S	37. 5	S
86.57	S	40. 3	S
86.58	S	41. 2	S
86.25	H	38. 7	S
85.48	H	40. 6	H
87. 2	H	40. 5	H
87.31	H	38. 9	H
85.48	H	39. 3	H
		37. 0	H
		38. 0	H
Mean — 86.17		Mean = 39.01	
		Z = — 0.01	
		39.00	

Position = 3° 43′ *np*

Distance = 12″.317

γ Delphini continued.

Comes = 78° 35′ *nf*. (Position.)   Distance = 446 (Parts.) = 2′ 20″.857.
(Single measures)

Other measures are,

1755.00; Position 0° 56′ Distance 12″.53; BRADLEY, cited by STRUVE.
1780.65; 4 34 *np*; H. MS. mean of 4 measures in 1779 .... 1783. Distance 11″.865; Ditto, mean of 17 measures.
1804.44; 3 20 *np*; H. MS.
1819.91; 4 42 *np*; Distance 12″.54; STRUVE, Additamenta, 197.

No appreciable motion has therefore taken place in this star.

No. CCCXXVIII. R. A. 20ʰ 50ᵐ; Decl. 3° 36′ N.

ε Equulei; III. 21; STRUVE 701;

Considerably unequal; large, white; small, decidedly blue or purplish; 7 and 9 magnitudes.

July 30, 1823.
Five-feet Equatorial.
nf

Position. ° ′		Distance. Parts.	
9.37	S	40. 2	S
10. 6	S	40. 3	S
10.15	S	39. 5	S
11. 0	S	41. 0	S
10.50	S	39. 8	S
11.45	H	40. 1	S
11.31	H	36. 0	H
11.12	H	39. 8	H
10. 8	H	38. 1	H
10. 5	H	37. 0	H
		37. 0	H
		39. 9	H
Mean = 10.39		Mean = 39.06	
		Z = + 0.12	
		39.18	

Position = 10° 39′ *nf*
Distance = 12″.374.

ε Equulei continued.

Other measures are,

1781.81;	Position 5° 39′ *nf*;	Distance 9″.375;	H. Catal. of 1782.
1819.94;	10 15 *nf*;	11″.35;	STRUVE, Additam. 197.

The distance of this star has increased considerably; and the change in this respect appears to be accompanied with a small variation in the angle.

No. CCCXXIX. R. A. $20^h\ 59^m$; Decl. 37° 52′ N.

61 Cygni; IV. 18; STRUVE, 705;

December 21, 1821.

Double; nearly equal; most beautifully defined; and the stars perfectly steady, allowing the perfection of measurement.

Five-feet Equatorial.
nf

Position. ° ′		Distance. Parts.	
5.30	H	49. 7	H
5.32	H	49. 5	H
5. 4	H	50. 5	H
6. 3	H	49. 9	H
6.25	S	49. 4	S
6.20	S	50. 3	S
5.56	S	49. 3	S
6.14	S	50. 0	S
5.30	S		
5.33	S		
Mean = 5.49		Mean = 49.82	
		Z = − 0.52	
		49.30	

Position = 5° 49′ *nf*
Distance = 15″.570

61 Cygni continued.

July 30, 1822.

Five-feet Equatorial.

nf

6 and 7 magnitudes.

Position. ° ′		Distance. Parts.	
6. 0	S	51. 5	S
6. 2	S	50. 6	S
5.46	S	49. 9	S
5.40	S	51. 8	S
5.46	S	50. 8	S
5.55	H	51. 8	H
5.44	H	48. 0	H
5. 3	H	52. 1	H
5. 8	H	51. 5	H
5.42	H	51. 3	H
Mean = 5.41		Mean = 50.93	
		Z = − 0.40	
		50.53	

Position = $5° 41'$ *nf*
Distance = $15''.958$.

April 9, 1823.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
4.15	S	44.3	S
4. 0	S	47.2	S
5.47	S	46.9	S
3.46	S	45.8	S
5.15	S	46.0	S
6. 0	H	47.2	H
4.42	H	46.9	H
5.37	H	49.0	H
3.40	H	46.8	H
3.42	H	48.0	H
Mean = 4.40		Mean = 46.81	
		Z = − 0.49	
		46.32	

Position = $4° 40'$ *nf*
Distance = $14''.629$.

Measures taken by very strong twilight.

August 9, 1823.

Five-feet Equatorial.

n f

Position. ° ′		Distance. Parts.	
5.15	S	50. 0	S
5.10	S	52. 2	S
4.12	S	51. 4	S
4.50	S	51. 3	S
5.15	S	50. 9	S
Mean = 4.56		Mean = 51.16	
		Z = − 1.57	
		49.59	

Position = $4° 56'$ *n f*
Distance = $15''.661$.

61 Cygni continued.

The observations of this remarkable star by different astronomers, arranged in order of time, are as follows :—

Date.	Position.	No. of Obs.	Distance.	No. of Obs.	Δ R.A.	No. of Obs.	Δ decl.	No. of Obs.	Authority.
	° ′		″						
1753.8	54 36 *nf*	—	19.628	—	14.40	2	16. 0	1	Bradley, cited by Bessel.
1778.0	39 2 *nf*	—	15.244	—	15.00	6	9. 6	5	Chr. Mayer, Ditto.
1781.9	36 11 *nf*	2	16.333	3					Herschel, Catal. and MS.
1784.4		—		—	22.50	1	6. 9	1	Dagelet, cited by Bessel.
1793.6	37 14 *nf*	—	14.873	—	15.00	1	9. 0	1	Lalande, Ditto.
1800.0	19 43 *nf*	—	19.267	—	21.60	17	6. 5	13	Piazzi, Catal. for 1800.
1805.0	11 32 *nf*	—	14.502	—	18.00	6	2. 9	8	Ditto, cited by Bessel. Fund.ª
1812.3	10 53 *nf*	—	16.741	—	19.80		3. 1		Bessel, Fund.ª Astronomia.
1813.8					19.60	37			Lindenau, cited by Ditto.
1814.5					20.32	2			Struve, Catalogus primus.
1819.9	6 58 *nf*	5	15.20	—	19.10	14	1.85		Struve, Additam. p. 180.
1822.9	5 19 *nf*	35	15.425	33					Herschel and South, mean result

The proper motion assigned by Piazzi and Bessel to 61 Cygni, are $+ 5''.38$ in R. A., and $+ 3''.30$ in declination. This affords indisputable proof of their connection in a binary system, otherwise the lapse of nearly 70 years, during which they have been observed, one of them would doubtless have left the other behind, without supposing a coincidence too extraordinary to have resulted from accident. Of the reality of this proper motion we have satisfied ourselves by a series of more than 500 micrometrical comparisons of the large star with minute stars in the neighbourhood, which will more properly be reserved for another communication.

The mean angular motion, as deduced from the micrometrical measures of 1781, 1819, 1822, (regarding the latter as perfectly correct) comes out $0°.7386$ per annum. The

61 Cygni continued.

mean motion deduced in like manner from a comparison of each of the remaining data with our mean result of 1822, comes out 0°.7196, a very satisfactory coincidence when the nature of such a mode of determination is considered. The mean of both gives a mean annual motion of 0°.730, in the direction *spnf* or direct. If we employ this to compute the position at the several times of observation, assuming that of 1822 as correct, we shall have the following comparison :—

Date.	Observed Position.	Calculated Position.	Error of Observation.
1753.8	54°.6 *nf*	55°.7 *nf*	— 1.1
1778.0	39.0	38.1	— 0.9
1781.9	36.2	35.2	— 1.0
1793.6	37.2	26.7	—10.5
1800.0	19.7	22.0	+ 2.3
1805.0	11.5	18.4	+ 6.9
1812.3	10.9	13.0	+ 2.1
1819.9	7.0	7.5	+ 0.5
1822.9	5.3	5.3	+ 0.0

The errors are not greater than might be expected when we consider that the most important of them, — 10°.5, is that of a single observation of each star by LALANDE, and that an error of 2″ in the difference of declination would suffice to produce it.

The mean angular motion of these stars then about their common centre of gravity is not far short of that of the two stars of Castor, while their apparent mutual distance is at

61 Cygni continued.

least three times as great. This circumstance, taken in connection with the rapidity of their apparent proper motion, affords a presumption of their being much nearer to us, and renders 61 Cygni a fit object for the investigation of parallax.

No. CCCXXX. R. A. 21ʰ 26ᵐ; Decl. 69° 46′ N.

β Cephei; III. 6; STRUVE, 724;

Very unequal; large, white; small, bluish; 3 and 8 or 9 magnitudes.

July 30, 1823?
Five-feet Equatorial.
sp

Position. ° ′		Distance. Parts.	
19.55	S	40. 6	S
19.55	S	41. 0	S
20.51	S	40. 0	S
21.18	S	39. 7	S
21. 7	S	40. 3	S
18. 1	H	40. 2	H
17. 5	H	45. 0	H
18.53	H	42. 6	H
17.30	H	41. 8	H
19. 2	H	42. 0	H
20.30	H	44. 0	H
20.56	H		
Mean = 19.35		Mean = 41.56	

Position = 19° 35′ *sp*
Distance = 13″.163

Mr. H. very uncertain about his measures.

Other measures are,

1781.97;	Position 15° 28′ *sp*;	Distance 13″.125;	H. Catal. of 1782.
1803.22;	17 18 *sp*;		H. (MS.)
1814.6;	17 5 *sp*;	Distance 12″.9;	STRUVE, Catalogus i. Stella 186.
1820.16;	20 6 *sp*;	13 .31;	Ditto, Additamenta, p. 198.
1821.17;	19 12 *sp*;		Ditto, Dorpat Obs. iii. See ZACH viii. 523.

There may be surmised a very slow change of position in these stars.

No. CCCXXXI. R. A. $21^h\ 28^m$; Decl. $5°\ 48'$ N.

3 Pegasi; V. 98;

6 and 10 or 9 magnitudes.

October 16, 1823.

Five-feet Equatorial.

np

Position.	Distance. Parts.
90°—11°.10′	125. 7
12.15	125. 3
9.35	124. 5
10.45	124. 3
12. 0	124. 9
10.25	
S	S
Mean — 11. 2	Mean = 124.94
	Z + 0.21
	125.15

Position = 78° 58′ *np*

Distance = 39″.525

Measures of distance very satisfactory; those of position not so good.

About five minutes north preceding this star is a faint double star of the second class, nearly equal, of the 12th or 14th magnitudes. With the five-feet equatorial no measures of it can be procured.

1783.34; *Position* 82° 48′ *np*; *Distance* 34″.72; H. Catal. of 1785.
1821.54; 80 30 *np*; 39″.208; STRUVE, Dorp. iii; p. 133. 141.

No. CCCXXXII. R. A. $21^h\ 36^m$; Decl. $27°\ 56'$ N.

μ Cygni; III. 15; STRUVE, 733;

Large, white; small, bluish; 5 and 6 magnitudes.

September 7, 1823.

Five-feet Equatorial.

sf

Position.	Distance. Parts.
90°—66°. 8′	18. 4
67.18	20. 7
66.20	18. 5
66.45	18. 7
67. 5	19. 3
S	S
Mean — 66.43	Mean = 19.12
	Z = — 0.37
	18.75

Position = 23° 17′ *sf*

Distance = 5″.922.

μ Cygni continued.

Comes 7 magnitudes.
nf

Position $= 28^\circ\ 41'$ *nf*
Distance $= 3'\ 38''.071$.

Position.		Distance. Parts.	
° ′			
29 0	S	690. 3	S
28.30		693. 8	
28.33		691. 9	
		689. 6	
		688. 7	
Mean = 28.41		Mean = 690.86	
		Z = − 0.37	
		690.49	

September 8, 1823.
Seven-feet Equatorial.
sf

Position $= 22^\circ\ 51'$ *sf*
Distance $= 5''.566$.

Position.		Distance. Parts.	
° ′			
90—66.30	S	25. 3	S
67.10		24. 1	
67.12		25. 0	
67.20		24. 3	
67.32		24. 5	
Mean = 67. 9		Mean = 24.64	
		Z = − 1.49	
		23.15	

Comes 7 magnitudes.
nf

Position $= 28^\circ\ 45'$ *nf*
Distance $= 3'\ 36''.958$.

Position.		Distance. Parts.	
° ′			
28.45	S	903. 8	S
28.50		904. 7	
28.40		903. 8	
		902. 5	
		904. 3	
Mean = 28.45		Mean = 903.82	
		Z = − 1.49	
		902.33	

μ Cygni continued.

Seven-feet. Distance. Parts.	Comes C. September 8, 1823.	Five-feet. Distance. Parts.
902. 0		688. 5
901. 7	Distance = 3′ 36″.247, 7-feet.	694. 0
901. 0 S		691. 6 S
900. 5	Distance = 3 38 .328, 5-feet.	693. 3
899. 1		692. 8
Mean = 900.86		Mean = 692.04
Z = − 1.49		Z = − 0.74
899.37		691.30

In these observations the lowest power belonging to the instrument = 68 was used.

Mean.

Position of AB 23° 4′ *sf*; *Distance* 5″.744; *Epoch* 1823.69.
AC 28 43 *nf*; 3′ 37″.401; 1823.69.

Other measures are,

1780.85; Position of AB 19° 16′ *sf*; Distance 6″.927; H. Catal. of 1782 and MS.
The position a mean of two measures in 1779 and 1781.

1819.93; Position of AB 21° 25′ *sf*; AC 28 31 *nf*; } STRUVE, Dorp. Obs. ii. p. 168. Obs. 164, 168.

The diminution of distance is remarkable; that of 1780 is a mean of 3 observations.

No. CCCXXXIII. R. A. $21^h\ 46^m$; Decl. 18° 55′ N.

74 of the 145?

Large, white; small, blue; 7 and 10, or perhaps 7 and 9 magnitudes.

September 24, 1823.

Five-feet Equatorial.

sf

Position.	Distance. Parts.
° ° ′	
90—69.32	69. 7
68.52	72. 0
69. 1	71. 7
69. 6	72. 0
68.32	70. 8
S	S
Mean — 69. 1	Mean = 71.24
	Z = — 1.36
	69.88

Position = 20° 59′ *sf*

Distance = 22″.069.

Stars on the meridian.

September 29, 1823.

Seven-feet Equatorial.

sf

Position.	Distance. Parts.
° ° ′	
90—70.40	92. 2
70.38	93. 4
69.59	94. 4
70.38	97. 5
70.30	96. 5
70.29	95. 5
Mr. Richardson.	S
Mean — 70.29	Meau = 94.92
	Z = — 3.27
	91.65

Position = 19° 31′ *sf*

Distance = 22″.036.

Mean.

Position 20° 15′ *sf*; *Distance* 22″.052; *Epoch* 1823.74.

This star was found in sweeping for 74 of the 145, with which it nearly agrees in place; but if it be the same it must have undergone a material change of position.

No. CCCXXXIV. R. A. $21^h\ 46^m$; Decl. $54^\circ\ 59'$ N.

57 of the 145;

Large, white; small, bluish.

September 24, 1823.

Five-feet Equatorial.

6 and $6\frac{1}{2}$ magnitudes.

sp

Position.	Distance. Parts.
$77^\circ\ 16'$	65. 3
77.52	66. 3
78.21	65. 4
77.11	66. 8
76.26	67. 7
75. 7	66. 0
S	S
Mean 77. 2	Mean = 66.25
	Z = − 1.36
	64.89

Position = $77^\circ\ 2'$ *sp*

Distance = $20''.493$.

September 27, 1823.

Seven-feet Equatorial.

6 and 7 magnitudes.

sp

Position.	Distance. Parts.
$76^\circ\ 0'$	88. 3
75.30	87. 8
75. 2	86. 0
75.20	87. 2
75. 0	87. 3
76.15	87. 2
75. 5	87. 6
S	S
Mean = 75.27	Mean = 87.34
	Z = − 3.56
	83.78

Position = $75^\circ\ 27'$ *sp*

Distance = $20''.144$.

Night extremely hazy, but stars on the meridian and steady.

Mean.

Position $76^\circ\ 11'$ *sp*; *Distance* $20''.308$; *Epoch* 1823.74.

No. CCCXXXV. R. A. $21^h\ 49^m$; Decl. $5^\circ\ 6'$ N.

III. 74; STRUVE, 736;

Equal; 7th magnitude.

October 9, 1823.

Five-feet Equatorial.

s p or *n f*

Position. ° ′		Distance. Parts.	
34.25	S	30. 0	S
33.57		31. 1	
32. 0		30. 6	
33.30		31. 6	
33.35		32. 6	
Mean = 33.29		Mean = 31.18	
		Z = + 0.78	
		31.96	

Position $=33^\circ\ 29'$ *sp* or *nf*

Distance $= 10''.093$.

North following: is a double star of the 6th class.

1783.56; Position $31^\circ\ 33'$ *nf*; Distance $14''.49$ (full measure), H. Catal. of 1785.

No. CCCXXXVI. R. A. $21^h\ 49^m$; Decl. $5^\circ\ 6'$ N.

Nova prope III. 74;

8 and 11 magnitudes.

October 9, 1823.

Five-feet Equatorial.

s p

Distance. Parts.		Distance. Parts.	
43.45	S	333. 0	S
43.45		335. 7	
44.30		334. 5	
Mean = 44. 0		Mean = 334.40	
		Z = + 0.78	
		335.18	

Position $= 44^\circ\ 0'$ *sp*

Distance $= 1'\ 45''.858$.

No. CCCXXXVII. R. A. $21^h\ 58^m$; Decl. 63° 45′ N.

ξ Cephei; II. 16; STRUVE, 739;

5th and 7th or $6\frac{1}{2}$ magnitudes.

August 14, 1823.

Seven-feet Equatorial.

n p

Position. ° ° ′		Distance. Parts.	
90—67. 0	S	24. 5	S
67.32	S	27. 0	S
67.40	S	25. 7	S
68. 0	S	25. 3	S
65.30	S	25. 0	S
64.30	S	26. 0	H
66.30	H	28. 0	H
66.15	H	25. 2	H
66.58	H	26. 5	H
67.45	H	27. 3	H
65.15	H		
68. 0	H		
Mean — 66.45		Mean = 26.05	
		Z = — 1.86	
		24.19	

Position = 23° 15′ *np*

Distance = 5″817.

Other measures are,

1781.97; 20° 18′ *np*; Distance 5″.000: H. Catal. of 1782.

1803.22; 23 46 *np*; Ditto. MS.

1820.16; 18 9 *np*; STRUVE, Dorp. Obs. iii; Obs. 23 and 25.

No. CCCXXXVIII. R. A. $22^h\ 3^m$: Decl. 58° 25′ N.

PIAZZI XXII. 11 and 12; STRUVE, 742;

Very nearly equal; 8 and $8\frac{1}{10}$ magnitudes.

September 24, 1823.

Five-feet Equatorial.

n p

Position. ° ° ′		Distance. Parts.	
90—43.35	S	72. 3	S
44.42	S	73. 3	S
43.46	S	71. 2	S
43. 5	S	72. 1	S
42.56	S	71. 0	S
Mean — 43.37		Mean = 71.98	
		Z = — 1.36	
		70.62	

Position = 46° 23′ *np*

Distance = 22″.303.

No. CCCXXXVIII. continued.

Position.	September 27, 1823.	Distance. Parts.
° ° ′	Seven-feet Equatorial.	
90—46. 5	as nearly equal as possible.	95. 3
47. 0		94. 1
46.12 } S	*np* or *sf*	95. 0 } S
45. 0		93. 5
45.25		95. 0
Mean — 45.56	Position = 44° 4′ *np* or *sf*	Mean = 94.58
	Distance = 21″.885.	Z = — 3.56
		91.02

Night extremely hazy, but stars steady.

Mean.

Position 45° 13′ *np*; *Distance* 22″.094; *Epoch* 1823.74.

Piazzi makes the difference of R. A.'s of these stars 25″, and that of their declinations 16″; whence we compute their position 50° 42′, and distance 20″.674; but the micrometrical measures are of course more exact.

No. CCCXXXIX. R. A. $22^h\ 4^m$; Decl. 21° 53′ S.

56 of the 145;

Large, white; small, blue decidedly; 7 and 9 magnitudes.

Position.	October 1, 1823.	Distance. Parts
° ° ′	Five-feet Equatorial.	
90—59. 3	*sf*	18. 6
61. 0		17. 3
60. 3 } S		18. 4 } S
57. 0		18. 7
55.30		19. 3
63.15	Position = 30° 42′ *sf*	18. 4
Mean — 59.18	Distance = 5″.170.	Mean = 18.45
		Z = — 2.08
		16.37

Stars just past the meridian.

No. CCCXL. R. A. $22^h\ 7^m$; Decl. $69°\ 17'$ N.

120 of the 145.

Large, white; small, blue; colors very decided.

September 24, 1823.

Five-feet Equatorial.

7 and 10 magnitudes.

sp

Position. (° ′)		Distance. Parts.	
15.46	S	47. 9	S
15.32	S	48. 6	S
17.28	S	48. 2	S
17.40	S	48. 3	S
18.15	S	49. 1	S
Mean = 16.56		Mean = 48.42	
		Z = − 1.36	
		47.06	

Position = $16°\ 56'$ *sp*

Distance = $14''.863$.

September 27, 1823.

Seven-feet Equatorial.

Large, white; small, blue.

sp

Position. (° ′)		Distance. Parts.	
14. 0	S	65. 0	S
13.50	S	64. 8	S
13.45	S	65. 4	S
14.30	S	65. 2	S
14.30	S	65. 5	S
Mean = 14. 7		Mean = 65.18	
		Z = − 3.56	
		61.62	

Position = $14°\ 7'$ *sp*

Distance = $14''.816$.

Mean.

Position $15°\ 31'$ *sp*; *Distance* $14''.839$; *Epoch* 1823.74.

No. CCCXLI. R. A. 2 ^{m}; Decl. $36°\ 51'$ N.

1 Lacertæ; STRUVE, 747;

Large, white; small, blue; small star does not bear a good illumination; 6th and 9th or 10th magnitudes.

September 11, 1823.

Five-feet Equatorial.

sp

Position. (° ′)		Distance. Parts.	
78.45	S	52. 3	S
78. 8	S	51. 0	S
76.12	S	50. 1	S
75. 0	S	48. 3	S
76.30	S	49. 7	S
Mean = 76.55		Mean = 50.28	
		Z = − 0.62	
		49.66	

Position = $76°\ 55'$ *sp*

Distance = $15''.683$.

1 Lacertæ continued.

Position.	September 27, 1823.	Distance. Parts.
81° 5′	Seven-feet Equatorial.	69. 0
79.15	7 and 12 magnitudes.	67. 9
80.10 S	*sp*	66. 8 S
81. 0		68. 5
81.10		69. 1
Mean = 80.32	Position = 80° 32′ *sp*	Mean = 68.26
	Distance = 15″.556.	Z = − 3.56
		64.70

Small star does not bear a good illumination.

Mean.

Position 78° 43′ *sp*; *Distance* 15″.619; *Epoch* 1823.72.

This is called III. 17 in STRUVE's Catalogue; but though the measures agree, there is some reason to question its identity with that star.

No. CCCXLII. R. A. $22^h\ 15^m$; Decl. 19° 56′ N.

33 Pegasi; V. 99; STRUVE, 749;

Position.	September 11, 1823.	Distance. Parts.
90°—13° 45′	Five-feet Equatorial.	176. 0
14.30	6 and $8\frac{1}{2}$ magnitudes.	178. 5
14.35 S	*np*	178. 3 S
14.15		178. 8
14.25		179. 2
Mean — 14.18	Position = 75° 42′ *np*	Mean = 178.16
	Distance = 56″.071.	Z = − 0.62
		177.54

33 Pegasi continued.

Position.		Distance. Parts.
° ° ′ 90—14.35, 14.20, 14. 3, 14. 5, 13.50 } S	September 17, 1823. Five-feet Equatorial. 6 and 9 magnitudes. *np*	178. 3, 179. 3, 179. 4, 178. 2, 178. 0 } S
Mean — 14.11	Position = 75° 49′ *np* Distance = 56″.020.	Mean = 178.64, Z = — 1.26, 177.38

Mean.

Position 75° 45′ *np*; *Distance* 56″.045; *Epoch* 1823.71.

1783.62; Position 89° 12′ *nf*; Distance 45″.05; H. Cat. 1785.

The proper motions assigned by PIAZZI to this star are + 0″.40 in R. A., equivalent to 0″.38 on the parallel, and — 0″.01 in declination. In 40 years therefore it should have moved 15″.2 from its place in a direction almost exactly coincident with the parallel, and supposing the small star at rest, and the position of 1783 correct, the angle at present should be 75° 38′, coinciding exactly with the observed. The proper motion of this star appears therefore to be well established in fact and correct in quantity.

No. CCCXLIII. R. A. 22h 16m; Decl. 65° 50′ N.

1789. 216; STRUVE, 751;

9 and 9½ magnitudes.

Position.		Distance. Parts.
° ° ′ 90—86. 0, 86.10, 85.45, 86.42, 85.54 } S	October 16, 1823. Five-feet Equatorial. *sf*	11. 2, 13. 0, 11. 5, 10. 7, 11. 3 } S
Mean — 86. 6	Position = 3° 54′ *sf* Distance = 3″.711.	Mean = 11.54, Z = + 0.21, 11.75

No. CCCXLIII. continued.

Position.		Distance. Parts.
° ° ′		
90—88.30		12. 4
88.50	Position = 1° 20′ *sf*	11. 2
88.32 R		10. 7 R
89. 0	Distance = 3″.723.	12. 0
88.28		11. 6
Mean — 88.40		Mean = 11.58
		Z = + 0.21
		11.79

Mean.

Position 2° 37′ *sf*; *Distance* 3″.717; *Epoch* 1823.87.

No. CCCXLIV. R. A. 22h 17m; Decl. 44° 27′ N.

64 of the 145; H. C. 2; Struve, 750;

8 and 8½ magnitude; does not bear a good illumination.

Position.		Five-feet Equatorial.	Distance. Parts.
° ′		October 1, 1823.	
+1.15 *nf*		*nf*	16. 5
+0.15 *nf*			14. 5
0. 0			16. 4 S
+0.12 *nf* S			15. 2
0. 0			14. 9
—0.30 *sf*	reduced ∠		
—0.35 *sf*	reduced ∠	Position = 0° 5′ *nf*	Mean = 15.50
			Z = — 2.08
Mean = +0. 5 *nf*		Distance = 4″.238.	13.42

No. CCCXLV. R. A. $22^h\ 17^m$; Decl. $17°\ 39'$ S.

41 of the 145; 53 Aquarii; STRUVE, 752;

Nearly equal; 6 and $6\frac{1}{2}$ magnitudes.

October 11, 1823.
Five-feet Equatorial.
np

Position.		Distance. Parts.
° ° ′		
90—55. 0		30. 8
56. 2		29. 8
55.58 S		31. 8 S
56.30	Position = 33° 57′ *np*	30. 7
56.45		30. 6
Mean — 56. 3	Distance = 9″.853.	Mean = 30.74
		Z = + 0.46
		31.20

October 16, 1823.
Five-feet Equatorial.
np

Position		Distance. Parts.
° ° ′		
90—56.20		31. 7
57. 3		33. 8
59. 0 S	7 and $7\frac{1}{2}$ magnitudes.	30. 0 S
57.45		31. 8
57.55		33. 4
58.15	Position = 32° 17′ *np*	32. 0
Mean — 57.43	Distance = 10″.210.	Mean = 32.12
		Z = + 0.21
		32.33

Measures difficult from low altitude.

At the time of measuring was not known to be 41 of the 145.

Mean.

Position 3° 7′ *np*; *Distance* 10″.032; *Epoch* 1823.86.

No. CCCXLVI. R. A. $22^h\ 20^m$; Decl. $0°\ 57'$ S.

ζ Aquarii; II. 7; Struve, 754;

Nearly equal; that to the south perhaps the smallest.

December 8, 1821.

Five-feet Equatorial.

s p

Position.	
$90° - 1°.47'$ *sf*	S
$- 0.29$ *sf*	S
$- 0.10$ *sf*	S
$+89.13$ *sp*	H
$90- 0.22$ *sf*	H
$+89.37$ *sp*	H
$+89. 0$ *sp*	H
$+88.30$ *sp*	H
$+88.55$ *sp*	H
Mean = $+89.54$	

Position $= 89°\ 54'$ *sp*

December 21, 1821.

Five-feet Equatorial.

sp

Position.		Distance. Parts.	
$89°.37'$	H	15. 5	H
89.28	H	14. 1	H
88. 1	H	16. 2	H
		17. 0	H
		16. 8	H
		14. 4	S
Mean = 89. 2		Mean = 15.67	
		Z = − 0.52	
		15.15	

Position $= 89°\ 2'$ *s p*

Distance $= 4''.785$.

Stars tremulous, and measures of distance difficult.

November 25, 1822.

sp or *nf*

Position.		Distance. Parts.	
$89°.8'$	H	16. 4	H
88.37	H	16. 1	H
88. 1	H	15. 0	H
90.55	H	18. 0	H
88.30	H	17. 8	H
88. 0	S	17. 8	S
89.27	S	16. 3	S
89.51	S	14. 8	S
90.20	S	16. 0	S
89.30	S	15. 1	S
Mean = 89.14		Mean = 16.33	
		Z = − 0.21	
		16.12	

Position $= 89°\ 14'$ *sp* or *nf*

Distance $= 5''.091$.

Mean.

Position $89°\ 29'$ *sp*; *Distance* $4''.989$; *Epoch* 1822.27.

ζ Aquarii continued.

The various measures of this star are,

1779.90;	Position 71° 5′ *nf*;	Distance 4″.56; H. Cat. of 1782 and "Account of Changes," &c.
1781.73;	71 39 *nf*;	
1782.47;	72 7 *nf*;	
1802.01;	78 3 *nf*;	(air too tremulous for measures); H. Account, &c.
1819.64;	88 0 *np*;	STRUVE, Additamenta. p. 198.
1820.92;	88 18 *np*;	Dist. = 4″.400; STRUVE, vide ZACH viii, 524, &c.
1821.76;	88 12 *np*;	
1822.27;	89 29 *sp* or *nf*;	Distance 4″.989; H. and S. ut supra.

The motion first noticed by Sir W. HERSCHEL in his paper of 1804 is therefore clearly confirmed. It is remarkable that M. STRUVE uniformly places the smaller star in the *n*-preceding quadrant, while our observations as regularly make it *sp* or *nf*, but the position is so nearly in the meridian that it is scarcely possible to perceive a bias one way or the other; and perhaps 90° *n* or *s* may be taken as the present situation without sensible error. In 42.37 years therefore the angle described is 19°, giving an average annual motion of 0°.4484 in the direction *npsf* or retrograde.

As the proper motion of ζ Aquarii (according to PIAZZI) amounts to 0″.173 or 7″.266 in 42 years, and yet the stars of which it consists still retain the same distance and nearly the same relative situation with respect to each other; this circumstance alone amounts to a proof of their mutual connection, which their equal size corroborates, and renders it exceedingly probable that they form a binary system.

No. CCCXLVII. R. A. $22^h\ 23^m$; Decl. $57°\ 30'$ N.
27 δ Cephei; V. 4; STRUVE, 755;
Considerably unequal; 5 and 8 magnitudes.

November 13, 1822.
Five-feet Equatorial.
sp

Position.		Distance. Parts.	
° ′			
79.58	S	132. 0	S
80.50	S	133. 0	S
81.25	S	131. 3	S
80.50	S	133. 7	S
80.39	S	136. 0	S
78.26	H	132. 0	S
76. 9	H	134. 0	H
77. 2	H	132. 4	H
75.46	H	130. 1	H
77. 8	H	131. 9	H
79.38	S	133. 1	H
79.12	S	133. 8	H
76.15	H		
78.52	S		
Mean = 78.44		Mean = 132.77	
		Z = − 1.01	
		131.76	

Position $= 78°\ 44'$ *sp*
Distance $= 41''.612$

1781.69; Position . . Distance $38''.3$; H. Catal of 1782.
1800.00; $73°\ 42'$ *sp*; 40 .5; PIAZZI, from his first Catalogue (computed by STRUVE.)
1814.18; 73 42 *sp*; 37 (estimated.) STRUVE, Catalogus Secundus. N.B. one of his angles is $78°\ 30'$; but the estimations are vague, and not greatly to be relied on.

No. CCCXLVIII. R. A. $22^h\ 28^m$; Decl. $38°\ 42'$ N.
8 Lacertæ; STRUVE, 757;
Triple; A 6th; B $6\frac{1}{2}$; C 12th or 15th magnitudes. Two largest, white; small, blue decidedly. AB *sp*, AC *sf*.

September 24, 1823.
Five-feet Equatorial.
Measures of AB
sp

Position.		Distance. Parts.	
° ′			
84.43	S	73. 5	S
85.15	S	73. 8	S
85.37	S	72. 8	S
85.40	S	73. 2	S
85.15	S	72. 9	S
Mean = 85.18		Mean = 73.24	
		Z = − 1.36	
		71.88	

Position $= 85°\ 18'$ *sp*
Distance $= 22''.701$.

8 Lacertæ continued.

Position.	Measures of AC.	Distance. Parts.
° ° ′ 90—34.30±	Five-feet Equatorial.	263. 0±
	sf	Z = — 1.36
	Position = 55° 30′ *sf* ±	261.64
	Distance = 1′ 22″.631.	

Measures of AC little better than guesses.

Position.	September 27, 1823.	Distance. Parts.
° ′	Seven-feet Equatorial.	
85.50 S	7 and $7\frac{1}{2}$ magnitudes.	94. 4 S
85.55 S	Measures of AB.	100. 2 S
86. 7 S	*sp*	96. 0 S
85.45 S		98. 8 S
86.30 S		99. 0 S
		98. 1 S
Mean = 86. 1	Position = 86° 1′ *sp*	Mean = 97.75
	Distance = 22″.648.	Z = — 3.56
		94.19

Position.	Measures of AC.	Distance. Parts.
° ° ′ 90—35. 0±	7 and 12 or 15 magnitudes.	Mean = 346. 3±
	sf	Z = — 3. 56
	Position = 55° 0′ *sf*	342.74
	Distance = 1′ 22″.409 ±	

Mean.

Position of AB;	85° 39′ *sp*;	*Distance* 22″.674;	*Epoch* 1823.74.
AC;	55 15 *sf*;	1′ 22″.520;	1823.74.

According to PIAZZI the difference of Right Ascensions of the two close stars in 1800 was 13″.3, and that of their declinations 16″, which would give 57° 2′ *sp* only for their angle of position, and 19″.072 for the distance; but this determination most probably is erroneous.

No. CCCXLIX. R. A. $22^h\ 34^m$; Decl. $9°\ 11'$ S.

213 Bode Aquarii; I. 50;

$8\frac{1}{2}$ and 10 magnitudes.

August 14, 1823.
Five-feet Equatorial.
np

Position.	Distance. Parts.
90° — 38°.35′	11. 5
39.52	13. 0
40. 0	12. 7
42. 0	13. 0
41.30	13. 0
Mean — 40.23	Mean = 12.64
	Z = — 2.20
	10.44

Position = 49° 37′ *np*
Distance = 3″.297

Measures excessively difficult.

October 9, 1823.
Seven-feet Equatorial.
np

Position.	Distance. Parts.
90° — 37°.12′	16. 9
37. 5	17. 5
36.35	17. 3
34.50	18. 7
39.10	17. 3
Mean 36.58	Mean = 17.54
	Z = — 2.98
	14.56

Position = 53° 2′ *np*
Distance = 3″.500.

The measures of this star are attended with the utmost difficulty. The night at times tolerably good.

Mean.

Position 51° 19 *np*; *Distance* 3″.398; *Epoch* 1823.70.

1821.92; Position 47° 42′ *np*; Struve, Dorp. iii. 142; by a mean of three measures.

The two sets of angles taken on Aug. 14 and Oct. 9 respectively, differ so considerably, that it is not improbable one ought to be rejected; if so, it should be that of Oct. 9. This is corroborated by a MS. measure of Sir W. Herschel in 1802, which makes it 42° 26′ *np*. The great difficulty of the measures can alone reconcile these discrepancies.

No. CCCL. R. A. $22^h\ 39^m$; Decl. $5°\ 9'$ S.

231 BODE Aquarii; II. 57; PIAZZI XXII. 219;

Triple; A the 9th, B the 10th, C the 12th magnitudes.

November 23, 1822.

Five-feet Equatorial.

Measures of AB.

sp

Position. ° ′		Distance. Parts.	
23.15	S	12. 7	S
23.50	S	14. 5	S
26. 0	S	13. 5	S
25.10	S	12. 5	S
24.25	S	14. 5	S
25. 0	H	15. 0	H
23. 8	H	14. 9	H
25. 1	H	14. 0	H
23.37	H	14. 9	H
24.35	H	13. 2	H
Mean = 24.24		Mean = 13.97	
		Z = − 0.20	
		13.77	

Position = 24° 24′ *sp*
Distance = 4″.349.

Measures of AC.

sf

Position. ° ° ′		Distance. Parts.	
90—17. 0	H	181. 0	H
16. 0	H	183. 4	H
17.55	H	181. 2	H
17.29	H	182. 2	H
17.14	H	180. 0	H
17.45	S	180. 8	S
17. 5	S	182. 3	S
17.30	S	183. 0	S
18.30	S	183. 0	S
18. 0	S	182. 0	S
Mean — 17.27		Mean = 181.89	
		Z = − 0.20	
		181.69	

Position = 72° 33′ *sf*
Distance = 57″.381.

Measures both of angle and distance excessively difficult.

1782.75; Position of AB 25° 51′ *sp*; H. Catal. of 1785.
1802.75; 27 53 *sp*; H. (MS.)

No. CCCLI. R. A. $22^h\ 48^m$; Decl. $40°\ 39'$ N.

16 Lacertæ; IV. 85; Struve, 769;

Extremely unequal; 6 and 10 magnitudes.

November 11, 1822.

Five-feet Equatorial.

nf

Position. ° ′		Distance. Parts.	
42.53	H	203. 0	H
44.32	H	209. 9	H
45.30	H	204. 8	H
45.56	H	204. 8	S
46.48	H	207. 0	S
44.41	S	209. 8	S
44. 0	S	205. 2	S
44.45	S	208. 0	S
43.15	S	204. 1	H
44.27	S	205. 1	H
		204. 6	H
Mean = 44.41		Mean = 205.94	
		Z = − 1.58	
		204.36	

Position = $44°\ 41'$ *nf*

Distance = $1'\ 4''.541$.

Measures extremely difficult.

This star is described as triple by Sir W. H. The nearer star was overlooked by us, or was too faint to be seen; the evening not being favorable. His measures of the more distant star are

1783.69; Position of AC $44°\ 24'$ *nf*; Distance $56''.61$; H. Catal. of 1785, corrected in the distance by reference to the MS. There are two measures, "$54''.57'''$ narrow measure, very inaccurate," and "$56''\ 37'''$ a good measure." The former is inserted by mistake for the latter in the printed paper.

No. CCCLII. R. A. $22^h\ 59^m$; Decl. $31°\ 51'$ N.

PIAZZI XXII. 306; STRUVE, 771;

7th and 10th magnitudes; large, white; small, blue; small star bears a tolerable illumination.

Position.		Distance. Parts.
° ° ′	September 28, 1823.	
90—31.40 ⎫	Five-feet Equatorial.	30. 6 ⎫
32.45 ⎪	*sf*	27. 0 ⎪
32. 4 ⎬ S		28. 0 ⎬ S
31.38 ⎪		28. 0 ⎪
31.14 ⎭		30. 3 ⎭
	Position = 58° 8′ *sf*	Mean = 28.78
Mean — 31.52	Distance = 8″.722.	Z = — 1.16
		27.62

Stars within 10 minutes of the meridian.

Position.		Distance. Parts.
° ° ′	September 29, 1823.	
90—31.45 ⎫	Seven-feet Equatorial.	38. 7 ⎫
31. 5 ⎪	7 and 9 magnitudes.	38. 5 ⎪
31. 0 ⎬ S	*sf*	41. 7 ⎬ S
31.15 ⎪		38. 3 ⎪
32.20 ⎭		40. 3 ⎭
Mean — 31.29	Position = 58° 31′ *sf*	Mean = 39.50
	Distance = 8″.711.	Z = — 3.27
		36.23

Stars on the meridian.

Mean.

Position 58° 19′ *sf*; *Distance* 8″.716; *Epoch* 1823.75.

No. CCCLIII. R. A. $23^h\ 2^m$; Decl. 46° 59′ N.

H. C. 242; Struve, 773;

September 28, 1823.
Five-feet Equatorial.
8 and 9 magnitudes.
sp

Position.	Distance. Parts.
° ′	
17.42 S	46. 5 S
16. 3 S	46. 8 S
16. 1 S	45. 9 S
16.32 S	46. 6 S
16.35 S	49. 2 S
	50. 0 S
Mean = 16.35	Mean = 47.50
	Z = − 1.16
	46.34

Position = 16° 35′ *sp*
Distance = 14″.636.

September 29, 1823.
Seven-feet Equatorial.
both bluish.
7 and $7\frac{1}{2}$ magnitudes.
sp

Position.	Distance. Parts.
° ′	
17.30 S	62. 7 S
17.37 S	66. 3 S
17.35 S	65. 2 S
17.25 S	65. 3 S
17. 0 S	64. 7 S
Mean = 17.25	Mean = 64.84
	Z = − 3.27
	61.57

Position = 17° 25′ *sp*
Distance = 14″.804.

Star 10 minutes west of the meridian.

Mean.

Position 17° 0′ *sp*; *Distance* 14″.709; *Epoch* 1823.75.

CCCLIV. R. A. $23^h\ 10^m$; Decl. $14°\ 26'$ S.

94 Aquarii; III. 34; STRUVE, 776;

Double; considerably or extremely unequal; large, ruddy; small, greenish; 6th and 9th or 10th magnitudes.

November 15, 1822.

Five-feet Equatorial.

np

Position ° ° ′		Distance. Parts.	
90—12.30	H	51.0	H
13.26	H	47.0	H
12.18	H	46.5	H
14.30	H	47.0	H
13.10	H	49.8	H
13.17	S	47.3	H
13.38	S	48.0	S
13.50	S	51.0	S
13.22	S	48.9	S
13.12	S	50.5	S
		47.5	S
		47.0	S
		49.0	S
Mean — 13.19		Mean = 48.50	
		Z = — 1.01	
		47.49	

Position $= 76°\ 41'$ *np*
Distance $= 14''.998$.

Other measures are,

1781.64; Position . . . Distance $13''.75$; H. Catalogue of 1782.
1802.68; $72°\ 45'$ very accurately taken; H. MS.)
1820.95; 79 30 STRUVE, Dorpat Obs. iii; ZACH, viii.
1821.92; 76 36; Distance $13''.991$; STRUVE, ibid. from △ decl. $13''.61$.

M. STRUVE'S last determination of the angle is probably nearest the truth.

No. CCCLV. R. A. $23^h\ 22^m$; Decl. $57^\circ\ 32'$ N.

Pretty unequal; 5th and 8th magnitudes; exactly in the parallel; both stars continue bisected through the entire length of the wire.

November 13, 1822.
Five-feet Equatorial.
p

Position = 0° 0′ preceding
Distance = 1° 13″.953.

$$\begin{array}{r}
\text{Distance.} \\
\text{Parts.} \\
\left.\begin{array}{r} 237.\ 2 \\ 235.\ 4 \\ 234.\ 3 \\ 235.\ 9 \\ 234.\ 1 \end{array}\right\}\text{H} \\
\left.\begin{array}{r} 233.\ 2 \\ 235.\ 0 \\ 235.\ 9 \\ 236.\ 2 \\ 234.\ 5 \end{array}\right\}\text{S} \\
\hline
\text{Mean} = 235.17 \\
\text{Z} = -\ \ 1.01 \\
\hline
234.16
\end{array}$$

No. CCCLVI. R. A. $23^h\ 37^m$; Decl. $19^\circ\ 41'$ S.

107 Aquarii; II. 24; STRUVE, 786.

Large, white; small, blue; 7 and 8 magnitudes.

$$\begin{array}{r}
\text{Position.} \\
\circ\ \ \ \circ\ \ \ ' \\
90 - \left.\begin{array}{r} 34.55 \\ 34.40 \\ 35.30 \\ 36.30 \\ 36.\ 0 \end{array}\right\}\text{S} \\
\hline
\text{Mean} - 35.31
\end{array}$$

October 16, 1823.
Five-feet Equatorial.
sf

Position = 54° 29′ *sf*
Distance = 5″.245.

$$\begin{array}{r}
\text{Distance.} \\
\text{Parts} \\
\left.\begin{array}{r} 16.\ 6 \\ 15.\ 7 \\ 16.\ 5 \\ 17.\ 7 \\ 15.\ 5 \end{array}\right\}\text{S} \\
\hline
\text{Mean} = 16.40 \\
\text{Z} = +\ \ 0.21 \\
\hline
16.61
\end{array}$$

107 Aquarii continued.

Position.		Distance. Parts.
90°—38°.31′ } R	Position = 52° 32′ *sf*	14. 5 } R
37.40	Distance = 4″.866.	15. 8
37.22		16. 0
37. 5		15. 0
36.40		14. 7
Mean — 37.28		Mean = 15.20
		Z = + 0.21
		15.41

Mean.

Position 53° 30′ *sf*; *Distance* 5″.056; *Epoch* 1823.79.

No. CCCLVII. R. A. $23^h\ 43^m$; Decl. 36° 54′ N.

28 BODE Andromedæ; H. C. 476; STRUVE, 789:

As nearly equal as possible; both bluish.

Position.		Distance. Parts.
+0°.30′ *sp* or *nf* } S	September 28, 1823.	19. 0 } S
—0.40 *np* or *sf*	Five-feet Equatorial.	17. 4
—0.15 *np* or *sf*	*np* or *sf*	17. 2
—0.20 *np* or *sf*		17. 9
—0.25 *np* or *sf*		18. 6
—0.23 *np* or *sf*		17. 5
—0.18 *np* or *sf*	Position = 0° 16′ *np* or *sf*	
Mean —0.16 *np* or *sf*	Distance = 5″.296.	Mean = 17.93
		Z = — 1.16
		16.77
	Comes 12 magnitude *sf*	
90°—45°.0′±		Mean = 714. 0±
	Position = 45° 0′ ± *sf*	Z = — 1.16
	Distance = 3′ 45″.131.	712.84

No. CCCLVII. continued.

Position.		Distance Parts.
° ′	September 29, 1823.	
+2. 0 *sp* or *nf*	Seven-feet Equatorial.	21. 7
+2.15 *sp* or *nf*	*sp* or *nf*	21. 0
+0.50 *sp* or *nf* } S		23. 5 } S
0. 0		24. 8
−0. 3 *np* or *sf*	Position = 1° 0′ *sp* or *nf*	23. 8
	Distance = 4″.726.	22. 8
Mean +1. 0 *sp* or *nf*		Mean = 22.93
		Z = − 3.27
		19.66
90° − 44° 15′ } S	Comes 15 magnitudes *sf*	945. 0 }
44.30		944. 0 }
Mean −44.22	Position = 45° 38′ *sf*	Mean = 944.50
	Distance = 3′ 46″.306.	Z = − 3.27
		941.23

Mean.

Position of AB 0° 17′ *sp* or *nf*; *Dist.* 5″.011; *Epoch* 1823.75.
AC 45 25 *sf*; 3′ 45″.941; 1823.75.

No. CCCLVIII. R. A. 23^h 46′; Decl. 30° 52′ N.

Double; considerably unequal; 8 and 11 magnitudes.

Position.		Distance. Parts.
° ° ′	November 23, 1822.	
90 − 29.30	Five-feet Equatorial.	139. 0
30.10	*n p*	120. 2
28.50 } H		126. 5 } H
31.28		139. 1
27.15		130. 0
34.30		Mean = 130.96
35. 0 } S	Position = 59° 11′ *np*	Z = − 0.20
26.12		130.76
34.20	Distance = 41″.297	
Mean − 30.49		

These measures extremely unsatisfactory.

No. CCCLIX. R. A. $23^h\ 50^m$; Decl. $54^\circ\ 45'$ N.

σ Cassiopeiæ; I. 5; STRUVE, 791;

6 and 10 magnitudes; large, white; small, blue; a miniature of ε Bootis.

Position.	Seven-feet Equatorial.	Distance. Parts.
° ° ′		
90—33.22 S	*np*	14. 6 S
32.30		14. 1
32.22		14. 9
32.15		14. 3
33.15	Position = 57° 13′ *np*	13. 8
32.57	Distance = 2″.603.	13. 8
Mean — 32.47		Mean = 14.25
		Z = — 3.42
		10.83

Measures extremely satisfactory; stars admirably defined.

Position.	Five-feet Equatorial.	Distance. Parts.
° ° ′		
90—31.45 S	*np*	10. 0 S
31. 8		9. 5
32. 0		9. 8
30.30		9. 4
32.15	Position = 58° 9′ *np*	10. 4
33.30	Distance = 3″.246.	9. 8
Mean — 31.51		Mean = 9.82
		Z = + 0.46
		10.28

Mean

Position 57° 41′ *np*; *Distance* 2″.924; *Epoch* 1823.8.

1781.97; Position 60° 28′ *np* } H. Account of Changes,
1804.44; 49 14 *np* : : } 1804.

The change surmised by Sir W. H. in this star is therefore not corroborated by our present observations.

No. CCCLX. R. A. $23^h\ 51^m$; Decl. $32°\ 43'$ N.

37 Bode Andromedæ; Struve, 793;

Double; nearly equal; a beautiful close double star.

November 23, 1821.

Five-feet Equatorial.

sp

Position.		Distance. Parts	
° ′			
81.14	H	16. 5	H
81.38	H	16. 0	H
81.51	H	17. 0	H
80.50	H	16. 1	H
81.50	H		
Mean = 81.29		Mean = 16. 4	
		Z = − 0.28	
		16.12	

Position = 81° 29′ *sp*

Distance = 5″.091.

December 16, 1821.

As nearly equal as possible; if any difference, *sp*.

Five-feet Equatorial.

Position.		Distance. Parts.	
° ′			
80.12	S	16. 5	S
80.45	S	17. 2	S
81.17	S	17. 9	S
82. 5	S	17. 0	S
82.14	S	17. 3	S
82.45	S	17. 0	S
82.30	S	17. 8	S
82. 5	S		
Mean = 81.44		Mean = 17.24	
		Z = − 0.26	
		16.98	

Position = 81° 44′ *sp*

Distance = 5″.362.

Mean result.

Position 81° 38′ *sp*; *Distance* 5″.263; 1821.92.

SUPPLEMENTARY CATALOGUE OF TWENTY DOUBLE AND TRIPLE STARS,

not included in the foregoing, for reasons stated in the beginning of this Paper.

No. CCCLXI. R. A. $0^h\ 2^m$; Decl. $4°\ 4'$ S.

BODE 27 Ceti; STRUVE 2;—(*)—;

Double; considerably unequal; both red. A very faint object, and only seen distinctly double when the eye is directed to another part of the field. Extremely difficult.

Position.	Nov. 27, 1821.	Distance.
$90° - 72°.0'$ H	Five-feet Equatorial.	Estimated. 10.0 H
70.30 S	*np*	8.0 S
Mean — 71.15		9.0

Position = 18° 45′ *np*
Distance = 9″.000 by estimation.

M. STRUVE measured this star on the 28th December 1820, (1820.99) and found the angle of position 20° 24′ *np*. Dorpat Obs. iii. p. 134. Obs. 89.

(*) In M. STRUVE's Catalogue this star is set down as III. 55. The latter however is not Ceti 27, but a star north-preceding υ Coronæ Borealis.

No. CCCLXII. R. A. $2^h\ 10^m$; Decl. $3°\ 48'$ S.

o (Mira) Ceti; VI. 1; STRUVE, 69;

Large star about 6th or 7th magnitude. Certainly not more than the sixth. Small, almost imperceptible, yet bears sufficient illumination to measure the angle. The large star is variable.

Position.	November 27, 1821.
° ′	Five-feet Equatorial.
2. 0 H	*nf*
0.50 S	
Mean = 1.25	Position = 1° 25′ *nf*

The angle agrees to 1′ with that of STRUVE, 1° 24′ *nf*, which he considers as particularly correct "certissimé emensus sum." The distance has not undergone that rapid change which Sir W. HERSCHEL surmised to take place in this star, as is evident by comparing M. STRUVE's measure 114″.25, taken in 1819.88, with the mean of two very accurate ones in 1780.69, which gives 113″.032. Some mistake therefore must have been made in the measures 1′ 44″.218 in the Catalogue of 1782, from which the motion was concluded with so much certainty. On searching the Journal for 1780 (September 8) two measures are found as follows:—

1st meas. 2 Rev. $59\frac{1}{2}$ P — 3 = 1′ 44″.062.
2d meas. 3 Rev. 0 P — 3 = 1 44 .374.

The mean of these is 1′ 44″.218, so that these are undoubtedly the measures referred to. They are however erroneously cast up, and a MS. correction (verified by re-computation) makes them respectively 1′ 50″.312, and 1′ 50″.625

No. CCCLXII. continued.

The following is an arranged statement of all the measures of this remarkable star.

Position.

2° 12′ *sf*; HERSCHEL. MS. Journal; 1782.65.
1° 24′ *nf*; STRUVE; - - - - 1819.88.
1° 25′ *nf*; HERSCHEL and SOUTH: 1821.90.

Distance.

′ ″ 1 50.468	HERSCHEL.	MS.	(Oct. 19.)	1779.80
1 52.812	Ditto	Ditto	- - -	1779.94
1 50.468	Ditto	Ditto	Mean of 2.	1780.69
1 50.000	Ditto	Ditto	- - -	1780.72
1 47.900	Ditto	Ditto	- - -	1781.62
1 52.620	Ditto	Ditto	- - -	1781.83
1 54.600	Ditto	Ditto	- - -	1782.65
1 51.267	Mean of the above.			1781.06
1 54.25	STRUVE, Additamenta, 183.			1819.88

The change of position from the southern to the northern side of the parallel may probably be relied on, though the whole amount of the angular change does not exceed 3° 36′. If M. STRUVE's observation can be depended on, (and the circumstances are all favorable to his method,) the distance must still have sensibly increased.

No. CCCLXIII. R. A. $3^h\ 24^m$; Decl. $23°\ 51'$ N.

7 Tauri; IV. 88; STRUVE, 96;

Double; extremely unequal; large, white; small dusky. A most difficult star. The small star disappears when the eye is directed full upon it.

Position.	
° ′	December 21, 1821.
36.22 } H	Five-feet Equatorial.
33.40 }	*nf*
31.30 S	
Mean = 33.54	Position = $33°\ 54'$ *nf*
	Distance = $21''.055$. by Estimation ($\frac{2}{3}$ Revol.)

This star was measured by Sir W. HERSCHEL in 1783, and the measures recorded in his second Catalogue are,

Position $23°\ 15'$ *nf*; *Distance* $19''.833$; 1783 13.

If the angles could both be relied on, which however from the obscurity of the small star is doubtful, a considerable change ($9°\ 39'$) must have taken place in the position, but little or none in the distance.

1821.95; $23°\ 42'$ *nf*; STRUVE, Dorpat Obs. iii. p. 144.

CCCLIV. R. A. $4^h\ 2^m$; Decl. $47°\ 57'$ N.

μ Persei; VI. 20; STRUVE, 114;

Excessively unequal; large, orange red.

December 8, 1821.

Five-feet Equatorial.

sp

Position = $38°\ 48'$ *sp*; (H) *Distance* = $1'\ 31''.559$; H.

(Single measures.)

Considered as rude approximations only, the small star being too faint for accuracy.

μ Persei continued.

Position.
° ′
39.20 } H
36.45 }

November 13, 1823.

Seven-feet Equatorial.

sp

Position = 38° 2′

4th and 12 magnitudes. The angles are good considering the extreme difficulty of the measures. A haze is coming on, and the stars will bear no illumination.

Mean.

Position 38° 18′ *sp* ; *Distance* 1′ 31″.559 ; *Epoch* 1822.85.

CCCLXV. R. A. 4^h 24^m ; Decl. 40° 43′ N.

Near 58 Persei ; III. 65 ; STRUVE, 128 ;

Double ; unequal ; magnitudes 7 and 8, or 8 and 9.

December 21, 1821.

Five-feet Equatorial.

Position = 59° 0′ *nf* *nf* Distance = 12″.468

(Single measures.)

The earlier measures of these are,

Position 48° 54′ *nf* ; Distance 11″.360 ; H. second Cat ; 1783.

The position however being stated to be very inaccurate, from windy weather, it is doubtful how far the difference of the angles may arise from a real motion.

No. CCCLXVI. R. A. $5^h\ 58^m$; Decl. 48° 44′ N.

41 Aurigæ; III. 82; STRUVE, 217;

Double; pretty unequal.

Position		February 22, 1822.	Distance. Parts.	
90°—8° 17′	H	Five-feet Equatorial.	25. 3	H
6.28	H	*np*	27. 0	H
7.46	H		24. 9	H
7.47	H		25. 5	H
5.35	S	7 and 8 magnitudes.	25. 8	S
6.55	S		24. 4	S
7.12	S		25. 0	S
8. 9	S	Position = 82° 37′ *np*	25. 5	S
8.14	S	Distance = 7″.643.	24. 7	S
Mean — 7.23			Mean = 25.34	
			Z = — 1.14	
			24.20	

Position.		December 31, 1822.	Distance. Parts.	
90°—6° 20′	H	Five-feet Equatorial.	33. 0	H
4.18	H	*np*	31. 1	H
6.29	H		32. 7	H
5. 7	H		31. 4	H
6.39	H		30. 9	H
7.30	S	6 and $6\frac{1}{2}$ magnitudes.	34. 5	S
7. 0	S		32. 8	S
5. 0	S		33. 6	S
6.12	S	Position = 83° 52′ *np*	34. 2	S
6.42	S	Distance = 9″.848.	33. 2	S
Mean — 6. 8			Mean = 32.74	
			Z = — 1.56	
			31.18	

Mean result.

Position 83° 16′ *np*; *Distance* 8″.809; *Epoch* 1822.53.

The measures in the Catalogue of 1785, are,

Position 80° 0′ *np*; *Distance* 8″.53; 1783.18.

No. CCCLXVI continued.

The angle is not materially changed. With regard to the distance, our two sets of observations agree each so well with themselves, and differ so completely from each other, that one is probably quite erroneous, and the other much nearer the truth than the mean of both.

No. CCCLXVII. R. A. $6^h\ 26^m$; Decl. $41°\ 40'$ N.

15 BODE Telescopii; STRUVE, 235;

Double; excessively unequal; the measures unsatisfactory.

February 22, 1822.

Five-feet Equatorial.

s f

Position = $43°\ 0'$ *sf*; *Distance* = $28''.064$; single measures.

Another star more distant about $5°$ more south following.

No. CCCLXVIII. R. A. $7^h\ 17^m$; Decl. $21°\ 49'$ N.

63 P. Geminorum; V. 53; STRUVE, 262;

Excessively unequal; only seen when the eye is directed to another part of the field; this extreme faintness of the small star precludes any accurate measures of distance.

February 22, 1822.

Five-feet Equatorial.

Position = $56°\ 10'$ *n p*

Sir W. H. has given no angle of this star, but states the distance at $44''.25$. (Catal. of 1785.)

No CCCLXIX. R. A. $9^h\ 10^m$; Decl. $35^\circ\ 9'$ N.

nf 40 Lyncis;

40 Lyncis is decidedly single, but near it is a star of the 9th magnitude, which at times may be seen double.

Position.		Distance.
° ′	April 9, 1823.	Parts.
57.15	Five-feet Equatorial.	Mean = 641. 0±
	nf	Z = − 0.49
	Measures of 40 Lyncis,	640.51

and the brightest of the two stars North following it.

Position $= 57^\circ\ 15' \pm nf$; Distance $= 3'\ 22''.287$.

Measures of the close star were attempted, but the unfavorableness of the evening prevented any being procured worth recording.

No. CCCLXX. R. A. $9^\circ\ 13'$; Decl. $54^\circ\ 47'$ N.

21 Ursæ Majoris; II. 73; Struve, 337.

Double; very unequal; 8th and 10th magnitudes.

Position.			Distance.	
° ° ′		February 13, 1822.	Parts.	
90—49.25	S	Five-feet Equatorial.	21. 2	S
50.30	S	*n p*	19. 9	S
50.37	S	Measures of AB.	20. 5	S
51.30	S		20. 2	S
51.19	S		20. 9	S
51.40	S		22. 0	
49.49	H		20. 0	
51.29	H	Position $= 39^\circ\ 2'$ *np*	21. 2	
52.23	H	Distance $= 6.''474$.	21. 7	
51. 0	H		Mean = 20.84	
Mean — 50.58			Z = − 0.34	
			20.50	

21 Ursæ Majoris continued.

March 15, 1823.

Five-feet Equatorial.

A third star C in view more minute than B.

Position.	
° ° ′	
90—15.40	S
14.35	S
15.57	S
Mean — 15.24	

np

Measures of AC.

Position $= 74^\circ\ 36'$ *np*

Distance $= 4'\ 45'' \pm$ single measure.

Other measures are,

1782.87; Position 36° 45′ *np*; H. Catalogue of 1782.
1802.39; 47 37 *np*; Ditto, Account of Changes.
1820.93; 47 12 *np*; STRUVE, Dorp. Obs. iii. p. 134.

M. STRUVE states these stars to be of the 7th and 8th magnitudes: of course he saw them under more favorable circumstances.

No. CCCLXXI. R. A. $9^h\ 17^m$; Decl. $63^\circ\ 51'$ N.

23 *h* Ursæ Major; IV. 29; STRUVE, 340;

Double; excessively unequal; 4th and 15th magnitudes.

February 5, 1822.

Five-feet Equatorial.

np

Position $= 0^\circ\ 33'$ *np*

Distance $= 27''.332$

Position. ° ° ′		Distance. Parts.	
90—89. 0	H	83. 7	H
—90.30	H	85. 4	H
—90. 5	H	87. 0	H
—88.42		89. 5	S
—89.16		86. 5	S
—89. 8		85. 7	S
Mean — 89.27		Mean = 86.30	
		Z = + 0.24	
		86.54	

23 *h* Ursæ Major continued.

Other measures are,

Position 3° 14′ *np* ; Distance = 19″.43 ; H. Catalogue of 1782.
1 30 *np* ; 21 .64 ; Struve, Additamenta, &c. ; 1818-9.

As the position is recognized by all the observers as *np*, it is probable that 0° 33′ is too small an angle, and that Struve's (1° 30′) is preferable. The enormous difference in the distances renders our observations open to question, yet there appears nothing against them in the Journal.

No. CCCLXXII. R. A. $11^h\ 7^m$; Decl. 15° 22′ S.

(104 of the 145);

7 and 9 magnitudes.

Position = 36° ± *np* ; Distance = 20″ ±

No. CCCLXXIII. R. A. $12^h\ 48^m$; Decl. 84° 24′ N.

212 Bode Camelopardali ; IV. 15 ; Struve, 429.

Double ; slightly unequal ; both bluish white.

March 14, 1821.

np

Position = 55° 56′ *np*

Distance = 21″.327.

Position. ° ′		Distance. Parts.	
54.30	H	73. 8	H
57.10	H	69. 0	H
56.50	H	69. 1	H
55.40	S	69. 6	H
55.20	S	73. 5	S
56. 5	S	69. 8	S
		70. 0	S
Mean = 55.56		Mean = 70.69	
		Z = − 3.16	
		67.53	

No. CCCLXXIII. continued.

Position.	May 7, 1823.	Distance. Parts.
° ° ′	Five-feet Equatorial.	
90—32.12 ⎫	*n p*	73. 3 ⎫
30.30 ⎪	6 and $6\frac{1}{4}$ magnitudes.	71. 0 ⎪
33. 5 ⎬ S	Position = 58° 3′ *np*	71. 5 ⎪
31.37 ⎪	Distance = 22″.811.	72. 0 ⎬ S
32.40 ⎪		72. 8 ⎪
31.38 ⎭		74. 0 ⎪
		72. 5 ⎭
Mean — 31.57		Mean = 72.44
		Z = — 0.21
		72.23

Mean.

Position 57° 0′ *np* ; *Distance* 22″.069 ; *Epoch* 1822.28.

No. CCCLXXIV. R. A. $13^h\,34^m$; Decl. 4° 27′ N.

o, 84 Virginis ; II. 44 ; STRUVE, 444 ;

Exceedingly unequal ; large, white ; small, decidedly blue.

Position.	May 3, 1821.	Distance. Parts.
° ′	Five-feet Equatorial.	Mean = 12. 5 ± H
42.10 ⎱ S	*sp*	Z = — 0.11
40.55 ⎰	Position = 40° 9′ *sp*	12.39
38.55 ⎱ H	Distance = 3″.913.	
38.35 ⎰		
Mean = 40. 9		

Other measures,

1782.12 ; Position 29° 5′ *sp* ; Interval $2\frac{1}{2}$ D H. Cat. 1785.
1802.31 ; 30 10 *sp* ; MS.
1821.33 ; 35 54 *sp* ; STRUVE, Dorp. Obs. iii. 3 meas.

o, 84 Virginis continued.

The distance has certainly diminished materially. With regard to the angles, one of the three positions must be erroneous; and if ours be correct, there is no doubt of a sensible or perhaps even a considerable angular motion. Further observations must decide.

No. CCCLXXV. R. A. $14^h\ 49^m$; Decl. $10^\circ\ 24'$ S.

18 Libræ; IV. 56; Struve, 468;

Triple; A of the 5th; B the 12th; C of the 15th magnitude. Excessively difficult. A line drawn through A and B will bisect C.

Position.	April 10, 1823. Five-feet Equatorial. Measures of AB. *nf*	Distance. Parts.
$53^\circ\ 0'$ } H		Mean = 85. 0 H
$54.\ 0$ }		Z = − 0.73
Mean = 53.30		84.27

Position = $53^\circ\ 30'$ *nf*
Distance = $26''.614$.

April 11, 1823. Five-feet Equatorial.

Position = $55^\circ\ 25'$ *nf*. Single measure.

Mean.

Position $54^\circ\ 8'$ *nf*; *Distance* $26''.614$; *Epoch* 1823.3.

No. CCCLXXVI. R. A. $15^h\ 2^m$; Decl. $19^\circ\ 6'$ S.

24 Libræ; VI. 44; STRUVE 475;

Excessively unequal.

May 28, 1822.

Five-feet Equatorial.

Position.		Distance. Parts.
$90^\circ - 67^\circ.20'$ H	*sf*	Mean = 210.0
64.30	Position = 23° 45′ *sf*	$Z_e = +\ 0.57$
66.55	Distance = 50″.629; little better than guessing.	210.57
Mean — 66.15		

April 11, 1823.

Five-feet Equatorial.

Triple; A = 6th; B = 11th; C = 11th magnitudes.

Measures of AB.

Position.	*sf*
$90^\circ - 75^\circ.0'$ H	Position = 18° 30′ *sf*
68. 0	Distance about 60 seconds.
Mean — 71.30	

A B and C are precisely in a line.

Mean.

Position 21° 39′ *sf*; *Distance* 50″.629; 1822.84.

Sir W. HERSCHEL'S measures are,

Position 22° 31′ *sf*; Distance 59″.05.

The diminution of distance (could it be fully depended on) would be very remarkable.

No. CCCLXXVII. R. A. $15^h\ 27^m$; Decl. 27° 20′ N.

STRUVE 489;

11 and 12 magnitudes.

June 11, 1823.

Seven-feet Equatorial.

sp

Position.		Distance. Parts.
° ′		
31.10 } S	Position = 30° 20′ *sp*	Mean = 25. 0± } S
29.30 }	Distance = 5″.941 ±	Z = − 0.29 }
Mean — 30.20		24.71

No. CCCLXXVIII. R. A. $16^h\ 38^m$; Decl. 2° 24′ N.

19 Ophiuchi; IV. 123; STRUVE, 533;

Double; extremely unequal.

May 28, 1822.

Five-feet Equatorial.

sf

Position about 10° *sf*; Distance 10 or 15 seconds.

No. CCCLXXIX. R. A. $17^h\ 52^m$; Decl. 22° 58′ S.

40 of the 145;

Double; 9th and 10th magnitudes.

July 11, 1823.

Five-feet Equatorial.

sp

Position = 61° 45′ ± *sp*; Distance = 10″.952 ± single measures. S.

May be easily measured in the 7-feet, but in its present place it cannot be directed to it.

No. CCCLXXX. R. A. $20^h\ 9^m$; Decl. $19^\circ\ 40'$ S.

σ Capricorni; V. 87; STRUVE, 668;

Position.	September 11, 1823.	Distance. Parts.
° ° ′	Five-feet Equatorial.	
90—3.30±	*sf*	Mean = 177. 0± S
3.10± S	6 and 12 magnitudes.	Z = − 0.62
4. 0±		176.38
Mean — 3.33+	Position $= 86^\circ\ 27' \pm sf$	
	Distance $= 53''.704 \pm$	

Measures of distance little better than a guess.

1783.60; *Position* $85^\circ\ 12'$ *sf*; *Distance* $50''.12$; H. Cat. 1785.

INDEX.

N. B. Remarkable Stars are pointed out by a * affixed in Column 1.

No.	Page.	*'s Name.	R.A.	Decl.	Angle of Position.	Quadrant.	Distance.	Remarks.
			h. m.	° ′	° ′		′ ″ Dec.	
1	24	35 Piscium	0 6	7 49 N	60 46	*sf*	0 11.168	Unchanged.
2	25	38 Piscium	0 8	7 51 N	32 9	*sp*	4.967	Unchanged.
3	26	51 Piscium	0 23	5 57 N	7 11	*nf*	25.866	Changed in Position.
4	27	π Andromed.	0 27	32 43 N	85 26	*sf*	35.951	Unchanged.
5	28	α Cassiopeæ	0 30	55 33 N	7 52	*np*	——	Unchanged in Angle; Dist. probably increased.
6	29	Andromed. 142	0 37	29 58 N	34 0	*sp*	46.464	Unchanged.
7	30	V. 82	0 37	50 7 N	11 29	*nf*	47.136	3° 41′ in Pos., and — 3″.706 in Dist.
8	30	η Cassiopeæ	0 38	56 51 N	7 56	*nf*	8.789	Binary + 0°.5133; mean annual motion.
9	32	65 Piscium	0 40	26 43 N	25 48	{ *np* *sf* }	5.960	Binary? — 0°.117 = mean annual motion.
10	33	Nova	0 42	67 51 N	55 12	*sp*	3.151	————
11	34	Andromed. 164	0 50	43 44 N	78 57	*sp*	7.520	————
12	34	26 Ceti	0 54	0 24 N	14 39	*sp*	15.756	Unchanged.
13	35	77 Piscium	0 56	3 57 N	7 20	*nf*	32.069	Unchanged.
14	36	74 ψ Piscium	0 56	20 30 N	71 2	*sf*	30.340	Pos. unchanged.
15	37	Polaris	0 58	88 22 N	61 11	*sp*	18.701	Unchanged.
16	41	ζ Piscium	1 4	6 37 N	26 33	*nf*	24.648	Unchanged.
17	42	37 Ceti	1 5	8 45 S	62 27	*np*	50.780	Pos. unchanged; Dist. much increased.
18	42	ψ Cassiopeæ	1 13	67 11 N	11 19	*sf*	33.347	Unchanged.
19	43	100 Piscium	1 25	11 38 N	9 35	*nf*	16.018	Unchanged.
20	44	γ Arietis 1 and 2	1 44	18 25 N	88 41	{ *np* *sf* }	9.109	Unchanged.
21	45	γ Arietis 1 and 3	—	——	4 46	*nf*	3 48.764	
22	46	47 Cassiopeæ	1 47	76 25 N	77 41	*sp*	1 33.594	————
23	46	λ Arietis	1 48	22 43 N	44 19	*nf*	37.889	Unchanged.
*24	47	Ceti 292	1 51	23 48 S	36 30	*np*	9.080	Much changed if the same star.
25	47	α Piscium	1 53	1 53 N	65 33	*np*	5.428	Unchanged.
26	49	γ Andromed.	1 53	41 28 N	25 14	*nf*	10.909	Unchanged.
27	50	59 Androm.	2 0	38 11 N	56 5	*nf*	17.157	Pos. unchanged.
28	52	ι Trianguli	2 2	29 27 N	12 2	*nf*	3.881	Pos. changed — 7° 39′.
29	53	66 Ceti	2 3	3 17 S	43 55	*sp*	16.173	Dist. unchanged.
30	54	H. C. 124	2 4	29 34 N	22 50	{ *sp* *nf* }	6.067	————
31	54	10, *a*? Trianguli	2 8	27 49 N	61 4	*sp*	14.347	. . . .
32	55	30 Arietis	2 26	23 52 N	2 26	*np*	38.445	Dist. increased.
33	56	33 Arietis	2 30	26 17 N	88 20	*nf*	29.185	Pos. unchanged.
*34	57	η Persei 1 and 2	2 38	55 8 N	29 53	*np*	28.959	Pos. Variable + 0°.25 per annum.
		——— 1 and 3	—	——	24 48	*np*	3 57.175	
35	59	π Arietis	2 39	16 42 N	32 29	*sf*	3.076	
36	61	41 Arietis	2 39	26 31 N	43 24	*sp*	2 7.557	Unchanged in Dist.
37	61	Ceti 499	2 59	6 46 N	73 25	*sf*	1 21.283	
38	62	32 Eridani	3 45	3 30 S	79 1	*np*	8.081	Sensibly changed.
39	63	ι Persei 1 and 2	3 46	39 29 N	79 38	*nf*	8.587	Pos. unchanged. Dist. increased sensibly.
		——— 1 and 3	—	——	54 0	*sf*		
40	64	φ Tauri	4 9	26 54 N	29 33	*sp*	56.841	Unchanged.

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No.	Page.	✱'s Name.	R. A.	Decl.	Angle of Position.	Quadrant.	Distance.	Remarks.
			h. m.	° ′	° ′		′ ″ Dec.	
41	65	χ Tauri	4 12	25 11 N	66 4	*nf*	19.962	Unchanged.
42	66	62 Tauri	4 13	23 52 N	19 37	*np*	29.052	Unchanged.
43	67	1 Camelopardali	4 18	53 31 N	36 26	*np*	10.450	
*44	67	57. *m.* Persei	4 21	42 39 N	71 8	*sp*	1 50.193	Dist. much increased + 13″.7.
45	68	88. *d.* Tauri	4 26	9 47 N	28 59	*np*	1 9.455	Dist. unchanged.
46	69	55 Eridani	4 35	9 9 S	48 20	{ *np* *sf* }	10.510	Unchanged ?
47	70	ω Aurigæ	4 47	37 36 N	82 1	*np*	7.892	Unchanged.
48	71	62 Eridani	4 48	5 28 S	15 16	*nf*	1 5.865	Position unchanged.
49	72	Orionis 26 1 and 2	4 49	14 15 N	34 36	*np*	38.827	
		——— 1 and 3	—	——	1 12	*nf*	. . . .	
50	73	IV. 43	5 0	8 53½ S	10 6	*nf*	21.763	Position hardly changed.
51	73	Capella	5 4	45 48 N	78 2	*np*	7 34.206	
52	74	14 Aurigæ	5 4	32 28 N	45 37	*sp*	14.610	Dist. unchanged; Pos. — 8°.0.
53	75	β Orionis	5 6	8 25 S	69 19	*sp*	8.878	Unchanged in Pos.; hardly in dist.
54	76	23 Orionis	5 13	3 21 N	62 40	*nf*	33.043	Unchanged.
55	77	118 Tauri	5 18	25 0 N	75 59	*sp*	5.666	Unchanged.
*56	78	32 Orionis	5 21	5 48 N	66 49	*sp*	< 1.300	Binary? mean motion — 0°.414.
57	78	Anonyma	5 21	3 11 N	62 41	*sf*	24.731	
58	79	III. 93	5 22	16 55 N	52 4	*sf*	9.790	Pos. unchanged.
59	80	33 *n* Orionis 1 and 2	5 22	3 9 N	63 21	*nf*	2.025	Unchanged.
		——— 1 and 3	—	——	55 54	*np*	4 19.734	
60	81	δ Orionis	5 23	0 27 S	89 57	*nf*	54.875	Unchanged.
61	82	Nova	5 23	2 39 N	83 9	*np*	1 8.912	
62	82	λ Orionis	5 25	9 48 N	49 14	*nf*	5.574	Unchanged.
63	83	σ Orionis AB	5 30	2 43 S	6 41	*nf*	12.912	Unchanged.
		——— AC	—	——	28 57	*nf*	42.765	Unchanged.
64	84	——— AD	—	——	52 57	*np*	3 30.805	
65	85	——— AG	—	——	33 44	*sf*	5 10.131	
		——— AH	—	——	31 11	*nf*	8 45.375	
66	86	——— DE	—	——	3 39	*sp*	11.136	Pos. unchanged.
	87	——— DF	—	——	68 11	*nf*	1 8.255	Very little changed.
67	87	ζ Orionis	5 32	2 3 S	60 3	*sf*	2.625	
		Comes	—	——	82 50	*nf*		
68	89	θ Aurigæ	5 47	37 11 N	82 16	*np*	2 5.051	
69	91	8 Monocerotis	6 14	4 41 N	64 39	*nf*	14.379	
70	92	15 Geminorum	6 17	20 54 N	65 21	*sp*	32.693	Unchanged.
71	93	11 Monocerotis A, B	6 20	6 55 S	39 29	*sf*	6.862	Unchanged.
		Ditto B and C			10 41	*sf*	3.243	Unchanged.
		Comes			67 20	*np*		
72	94	20 Geminorum	6 22	17 54 N	61 3	*sp*	19.454	
73	94	ν Canis Maj.	6 29	18 31 S	10 8	*sp*	17.240	Changed in Pos.; ? in Dist.
*74	95	12 Lyncis (Note)	6 30	59 37 N	68 39	*sf*	2.593	Binary — 0°.5574 per annum (Note.)
					36 50	*np*	9.849	Pos. changed; + 0°.109 per annum.
75	97	56 Aurigæ	6 34	43 45 N	72 52	*nf*	55.386	Pos. unchanged.

(Note) 12 Lyncis. The change of relative position in the three stars is conformable to the idea of a rotation of the two closer ones (A, B) about their common centre of gravity, the distant one (C) remaining at rest. Although the present data are very imperfect, we may yet compute the masses which satisfy the conditions, by the formula

$$\frac{A}{B} = \frac{\text{Angular Vel. of B}}{\text{Angular Vel. of C}} \times \frac{\text{Dist. of B}}{\text{Dist. of C}} \times \text{Cos.} \left\{ \text{Mean Pos. } (sf) \text{ of B} - \text{Mean Pos. } (np) \text{ of C} \right\}$$

$$= \frac{5574}{1086} \times \frac{2593}{9849} \times \text{Cos. } (45^\circ\ 20') = 0.9503, \text{ or nearly a ratio of equality.}$$

The apparent magnitudes also are nearly equal; and though it is true the inequality lies the other way, yet it must be remembered that in results so obtained, even an approach to coincidence adds something to the degree of probability. Further observations must decide on their real value.

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76	98	38 Geminorum	6 44	13 24 N	84 24	sf	0 5.528	Dist. diminished.
77	99	ζ Geminorum	6 53	20 50 N	85 27	np	1 31.032	Pos. slightly changed.
78	100	19 Lyncis	7 8	55 37 N	43 5	sp	14.544	Scarcely changed.
					86 45	sf	3 33.357	
79	101	20 Lyncis	7 9	50 27 N	17 21	sp	16.988	
80	102	δ Geminorum	7 9	22 18 N	74 35	sp	7.248	Probably unchanged.
*81	103	α Geminorum 1 and 2	7 23	32 17 N	3 57 Ep. 1822.16	sp	5.355 Ep. 1822.10	Binary. Mean mot. —0°.965.
		——— 1 and 3			71 34	sf	1 10.180	
		——— 1 and 4			45 45	sp	3 17.114	
*82	107	Canis Min. 31	7 31	5 43 N	37 8	sf	———	Binary? Pos. changed — 10°.
83	109	π Geminor.	7 36	33 51 N	69 55	np	1 33.984	
84	110	2 Argo Navis	7 37	14 15 S	69 27	np	19.660	Pos. unchanged.
85	110	Geminor. 201	7 38	18 47 N	0 9	sp	6.384	Unchanged.
86	112	Urs. Maj.? 2	7 46	63 34 N	6 48	nf	46.647	
87	112	14 Canis Min. 1 and 2	7 49	2 47 N	24 18	nf	1 16.021	Dist increased greatly.
		——— 1 and 3	—	——	62 50	sf	1 52.168	Single measures.
88	113	11 Cancri	7 58	28 0 N	84 30	np	4.498	Unchanged.
89	114	29 Monocer. 1 and 2	8 0	2 28 S	27 1	sp	1 6.503	
		——— 1 and 3	—	——	30 16	sp	3 18+	Distance an inaccurate estimation only.
*90	115	ζ Cancri	8 2	18 11 N	68 17	sf	6.241	Binary? Mean mot. = — 0°.5813; — 23° 42′ in Angle, and — 1″.805 in Dist.
91	116	19 Argo Navis	8 3	12 24 S	14 3	sp	1 10.175	
*92	117	24. ν. Cancri	8 16	25 7 N	52 13	nf	6.046	Binary? Mean mot. — 0°.514; Dist. incr. 2″.
93	118	φ² Cancri	8 16	27 31 N	58 47	{sp nf}	5.514	Unchanged.
94	120	Hydræ 18	8 26	7 15 N	65 57	nf	10.844	Scarcely changed in Pos.
95	122	48. ι. Cancri	8 36	29 25 N	37 42	np	29.387	Unchanged (? colour.)
96	123	144 of the 145	8 39	71 27 N	58 51	{sp nf}	8.745	
97	124	IV. 111	8 41	15 29 N	34 16	sf	16.521	Position changed — 5° 16.
98	125	57. ι 2. Cancri	8 43	31 16 N	70 11	np	1.894	Unchanged.
99	125	17 Hydræ	8 47	7 17 S	86 8	{np sf}	5.723	Unchanged.
100	126	σ. 3. Cancri	8 49	33 7 N	24 49	np	1 29.731	Pos. unchanged.
101	127	67. ρ. Cancri	8 51	28 36 N	52 40	np	1 43.144	Pos. unchanged.
102	127	Cancri 194	8 57	23 42 N	68 37	sp	7.640	Pos. unchanged; Dist. —1″.19.
103	128	Urs. Maj. 53	8 59	62 24 N	64 49	nf	25.346	
104	129	38 Lyncis I. 9	9 7	37 34 N	27 20	sp	2.887	Unchanged.
105	131	27 Hydræ	9 42	8 48 S	59 21	sp	3 45.689	Pos. unchanged.
106	131	τ Hydræ	9 20	2 0 S	86 49	nf	1 6.683	Pos. very slightly changed.
107	132	6 Leonis	9 22	10 30 N	15 27	nf	38.128	Scarcely altered.
108	132	7 Leonis	9 26	15 10 N	9 25	nf	44.199	Unchanged.
109	133	14 Leonis	9 32	10 43 N	53 38	nf	1 10.829	Changed in Pos. and Dist.?
110	133	Felis 40	9 56	12 17 S	2 45	np	21.498	
111	134	α Leonis	9 59	12 51 N	37 16	np	2 54.906	Slight change in Pos.
112	135	145 of the 145	10 3	71 55 N	75 20	sf	16.843	
*113	136	γ Leonis 1 and 2			8 24	sf	3.243	Binary. Mean mot. + 0°.30; Epoch 1822.24.
	137	——— 1 and 3			27 30	np	———	Inaccurate.
114	139	Leonis 145	10 11	7 22 N	80 15	nf	6.723	Pos. changed 4° 47′; Dist. unaltered.
115	140	Leonis 155	10 14	6 38 N	60 23	np	1 0.387	Unchanged.

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116	141	35 Sextantis 1 and 2	10 34	5 42 N	32 26	*sp*	0 7.869	
		——— 1 and 3	—	——	60 30	*sp*	5 33.500	Single measure.
117	142	54 Leonis	10 46	25 43 N	8 19	*sf*	7.023	Unchanged.
118	143	V. 111	10 49	59 50 N	51 46	*nf*	35.010	Dist. increased ?
119	144	68 of the 145	11 6	53 44 N	75 29	*np*	13.144	
120	145	26 of the 145	11 8	6 8 S	7 37	*sf*	1 7.062	
121	145	φ Leonis	11 8	2 40 S	16 56	*np*	1 46.256	Much changed in Pos. and Dist.
*122	146	ξ Ursæ Maj.	11 9	32 33 N	11 33 Ep. 1823.29	*sp*	2.809 Ep. 1823.19	BINARY. Mot. = — 5.036. Annual mot. very variable. (See Note.)
123	151	Camelop. 201	11 17	82 2 N	43 13	*np*	21.876	
124	151	83 Leonis	11 18	4 0 N	61 7	*sf*	29.542	Pos. changed + 6° 11′.
125	152	τ Leonis	11 19	3 50 N	79 8	*sf*	1 35.217	Much increased in Dist.
126	153	70 of the 145	11 21	42 21 N	0 21	*sf*	13.040	
127	153	88 Leonis	11 23	15 22 N	50 14	*np*	14.670	Scarcely altered.
128	154	90 Leonis 1 and 2	11 25	17 48 N	61 8	*sp*	4.452	No change.
		——— 1 and 3	—	——	36 41	*sp*	1 0.753	Pos. unchanged.
129	156	93 Leonis	11 38	21 13 N	86 15	*np*	1 14.897	
130	157	Nova	11 38	21 2 N	65 3	*nf*	1 16.861	
131	157	ξ Virginis 1 and 2	11 39	9 15 N	3 25	*np*	———	
		——— 1 and 3	—	——	53 19	*np*	———	
132	158	V. 60	11 44	16 26 N	75 57	*nf*	37.112	Pos. changed — 5°.
133	158	65 Ursæ Maj. 1 and 2	11 46	47 29 N	55 26	*nf*	4.020	Unchanged.
		——— 1 and 3	—		24 17	*sf*	1 2.185	Scarcely altered.
134	159	2 Comæ Ber.	11 55	22 28 N	31 15	*sp*	3.685	Very little if at all changed.
135	160	H. C. 354	12 3	54 28 N	46 19	*sp*	12.102	
136	160	Camelop. 207	12 3	82 43 N	13 16	*nf*	1 3.445	
137	161	H. C. 152	12 6	6 15 S	18 9	*np*	9.225	
138	161	2 Canum Ven.	12 7	41 40 N	10 29	*sp*	11.534	Unchanged.
139	162	STRUVE 408	12 8	81 6 N	50 15	*sp*	15.389	
140	163	22 of the 145	12 9	2 56 S	72 58	*sp*	21.017	
141	164	Comæ Ber. 55	12 12	28 5 N	23 42	*sp*	9.453	
*142	165	17 Virginis	12 13	6 19 N	69 36	*np*	20.937	Change of + 11° 15′ in Pos., arising from proper motion.
143	166	12 Comæ Ber.	12 13	26 51 N	78 47	*sf*	1 5.950	Pos. unchanged.
144	167	H. C. 385	12 19	45 50 N	73 52	*sf*	11.079	
145	167	δ Corvi	12 21	15 30 S	56 27	*sp*	24.005	Unchanged.
146	168	H. C. 231	12 22	2 20 N	19 39	*np*	49.745	
147	169	118 of the 145	12 25	75 46 N	67 10	*nf*	5.865	
148	169	24 Comæ Ber.	12 26	19 22 N	2 7	*np*	20.647	Unchanged.
149	170	38 of the 145	12 32	12 1 S	29 26	*sf*	6.881	
*150	171	γ Virginis	12 33	0 27 S	13 24	*sf*	3.794	BINARY. Elliptic orbit probably. Mean mot. —0°.667.
151	173	III. 53	12 36	2 54 S	78 15	*np*	16.766	
152	174	H. C. 230	12 40	4 48 N	75 38	*sp*	10.109	
153	174	IV. 58 1 and 2	12 43	20 9 N	67 49	*sp*	16.963	Unchanged.
		——— 1 and 3	—	——	59 23	*np*	4 9.666	
		——— 1 and 4	—	——	4 0	*sp*	10 31.644	
154	175	35 Comæ Ber.	12 44	22 14 N	38 18	*sf*	29.494	Unchanged.
155	176	H. C. 73	12 44	16 0 N	79 53	{*sp* *nf*}	7.995	

(Note.) ξ Ursæ Majoris. By Observations made by Mr. SOUTH, at Passy, since the communication of this Paper, it appears *that the angular motion of these stars continues at nearly the same rate (— 5°.425), indicating indeed a slight diminution of velocity, but not to the extent supposed p. 150, which, therefore, must have arisen from M. STRUVE's observations of 1821 and 1822 being rather too much in advance.

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156	176	II. 42	12 46	3 54 S	63 19	sf	0 6.758	Pos. changed + 7° 55′.
157	177	Piazzi XII. 221	12 47	12 29 N	73 43	sf	29 170	
158	177	12 Canum Ven.	12 48	39 18 N	43 2	sf	19.764	Unchanged.
159	178	Struve 430	12 48	55 1 N	15 15	np	4.136	
160	180	θ Virginis 1 and 2	13 1	4 34 S	77 8	np	8.301	Pos. changed + 7° 50′.
		——— 1 and 3			24 3	np		
161	181	54 Virginis	13 4	17 51 S	56 17	nf	6.774	Distance increased.
162	181	Piazzi XIII. 25	13 6	10 24 S	28 21	nf	44.847	
163	182	H. C. 506	13 15	3 38 N	13 39	{nf / sp}	28.465	
164	182	ζ Ursæ Maj.	13 17	55 52 N	57 46	sf	14.455	Unchanged.
165	185	V. 128	13 23	11 46 S	11 13	nf	47.720	Distance increased.
166	186	H. C. 335?	13 26	27 10 N	24 51	nf	9.613	
167	186	81 Virginis	13 28	6 57 S	47 16	nf	4.020	Pos. changed — 6° 4′.
168	187	H. C. 335?	13 41	27 52 N	70 25	sf	5.664	
169	188	η Bootis	13 46	19 19 N	29 27	sf	2 6.203	
170	189	H. C. 162	13 46	33 43 N	58 28	np	7.780	
171	190	τ Virginis	13 52	2 26 N	19 57	np	1 19 290	
172	190	82 of the 145	13 54	20 17 N	71 43	sf	21.392	
173	191	98 of the 145	14 5	6 14 N	79 20	sp	6.049	
174	191	κ Bootis	14 7	52 39 N	31 15	sp	13.136	Position slightly changed.
175	193	ι Bootis	14 10	52 12 N	56 36	nf	38.047	Very little changed.
176	194	Piazzi XIV. 62	14 13	6 56 S	77 6	np	5.880	
177	195	H. C. 334	14 14	9 16 N	83 24	sp	7.185	
178	196	H. C. 470	14 15	12 3 N	65 17	np	10.192	
179	197	χ Turdi Sol.	14 15	19 8 S	25 49	np	35.121	
180	198	H. C. 165	14 22	29 6 N	7 36	sp	25.781	
181	199	π Bootis	14 32	17 12 N	7 53	sf	6.889	Unchanged.
182	200	ζ Bootis	14 33	14 31 N	36 58	sf	1.683	
183	201	II. 82	14 36	8 27 N	4 27	sf	7.335	Unchanged in Position.
184	202	73 Hydræ	14 36	24 40 S	46 40	sf	9.995	Changed 8° 25′ in Pos.
*185	204	ε Bootis	14 37	27 51 N	52 59 Ep. 1822.55	np	3.931 Ep. 1822.55	Binary. Mean mot. + 0°.4378
186	208	α Libræ	14 41	15 15 S	44 33	np	3 50.853	
*187	208	ξ Bootis	14 43	19 51 N	70 54	np	8.696 Ep. 1822.63	Greatly changed, perhaps by proper motion both in Angle and Distance.
188	213	39 Bootis	14 44	49 27 N	44 55	sf	4.626	Probably changed in Pos. Our obs. rather dubious.
189	215	Bootis 346	14 55	48 2 N	68 53	sf	36.544	Unchanged.
190	216	28 of the 145	14 48	20 35 S	0 9	np	10.833	
191	216	63 of the 145	14 55	54 33 N	73 10	np	40.845	
192	217	37 of the 145	14 56	6 12 N	76 30	np	10.749	
193	218	44 Bootis	14 58	48 21 N	40 53	sp	2.277	
194	219	H. C. 472	14 59	9 55 N	60 50	sp	4.777	
195	220	Libræ 97	15 4	17 45 S	50 58	sf	49.037	
196	221	V. 125	15 5	28 36 N	43 17	sp	32.553	
197	221	62 of the 145	15 5	19 56 N	80 51	nf	25.842	
198	222	H. C. 289	15 5	39 22 N	13 29	np	31 239	
199	222	δ Bootis	15 8	34 0 N	10 31	nf	1 45.333	Slightly changed in Position.
200	223	H. C. 470	15 10	11 7 N	84 20	sf	13 268	

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*246	276	δ Herculis	17 8	25 3 N	82 10	*sf*	0 28.869	Altered + 9° 42′ in Pos., and − 5″.349 in Dist.
247	277	ν Serp. Ophiuchi	17 11	12 39 S	59 13	*nf*	50.213	
248	277	ρ Herculis	17 17	37 19 N	37 53	*np*	4.463	Pos. changed 7° 32′ Dist. + 1″.494.
249	278	53 Ophiuchi	17 26	9 43 N	78 41	*sp*	41.662	Unchanged in Position.
250	279	ν Draconis	17 29	55 19 N	42 23	{ *np* / *sf* }	1 2.242	Unchanged in Position.
251	280	Ophiuchi 254 1 and 2	17 30	2 8 N	58 7	*np*	1 51.213	
		——— 1 and 3	—	———	68 37	*nf*	2 18.090	
		——— 2 and 3	—	———	27 23	*nf*	1 54.310	
252	281	61 Ophiuchi	17 36	2 41 N	3 33	*sf*	20.520	Unchanged.
253	283	H. C. 348	17 36	13 14 S	66 48	*sp*	15.869	
254	284	ψ Draconis	17 45	72 14 N	75 14	*nf*	31.777	
255	285	67 Ophiuchi	17 52	2 57 N	53 4	*sf*	55.228	
256	286	H. C. 168	17 52	30 5 N	8 53	*np*	20.181	
257	287	95 Herculis	17 54	21 36 N	8 8	*nf*	6.623	
*258	288	70 *p* Ophiuchi	17 56	2 33 N	64 48	*sf*	4.266 Ep. 1822.42	Binary. Mean Annual motion — 6°.811 not uniform.
259	292	H. C. 362.	17 57	64 9 N	15 27	*np*	21.093	
260	293	III. 56.	17 57	12 0 N	12 21	*sp*	6.748	Scarcely changed.
261	294	73 τ Ophiuchi	18 1	3 57 N	12 23	*sp*	1.989	Distance increased.
262	296	100 Herculis	18 1	26 5 N	87 35	{ *nf* / *sp* }	14.281	
263	296	Anonyma	18 7	18 49 S	77 52	*nf*	54.302	
264	297	Struve 569	18 8	18 38 S	37 22	*nf*	16.419	
265	298	I. 86.	18 12	25 28 N	82 48	*np*	4.587	
266	299	H. C. 298	18 12	15 10 S	51 37	{ *sp* / *nf* }	14.091	
267	299	40 Ceph. or Drac.	18 13	71 58 N	34 56	*sp*	21.362	Unchanged.
*268	301	59 *d* Serpentis	18 18	0 5 N	48 5 Epoch	*np* —	4.151 Ep. 1822.95	Binary? Orbit in a plane nearly passing through the eye.
*269	303	39 Draconis 1 and 2	18 21	58 42 N	86 5	*nf*	3.599	Binary? Mean motion — 0°.205.
		——— 1 and 3			68 5	*nf*	1 30.201	
270	305	H. C. 300	18 30	52 13 N	4 34	*np*	26.226	
271	305	H. C. 294	18 30	41 7 N	70 15 : :	*np*	6.000	: :
*272	307	α Lyræ	18 31	38 37 N	42 7	*sf*	42.108 Ep. 1822.87	Changed both in Angle and Dist. by proper motions.
273	309	IV. 94.	18 36	34 32 N	5 51	*nf*	24.630	
274	310	H. C. 296.	18 36	10 39 S	66 18	*np*	5.306	
275	310	5 Aquilæ	18 37	1 9 S	32 42	*sf*	14.468	
*276	311	4, ε Lyræ	18 38	39 27 N	64 7	*nf*	4.010	Binary? Mean motion — 0°.19 per ann.
277	313	Debilissima inter ε and 5 Lyræ	18 38	39 27 N	50 ±		53 ±	
278	314	5 Lyræ	18 38	39 27 N	69 56	{ *np* / *sf* }	3.801	Binary. Mean motion — 0°.325.
279	315	ζ Lyræ	18 38	37 25 N	59 51	*sf*	44.240	
280	317	H. C. 170.	18 42	10 47 N	85 28	*sp*	4.794	
281	317	β Lyræ	18 43	33 10 N	60 1	*sf*	45.778	
282	318	H. C. 19?	18 48	33 46 N	80 15	*np*	46.035	
283	319	θ Serpentis	18 48	3 58 N	14 26	*sf*	21.679	
284	320	ο Draconis	18 49	59 10 N	79 11	*np*	29.949	
285	321	Piazzi XVIII. 274.	18 54	0 58 S	58 49	*sf*	26.019	

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286	322	15 Aquilæ	18 56	4 17 S	63 16	sp	35.619	
287	323	Anonyma	18 58	6 53 N	67 46	np	8.521	
288	324	H. C. 19? Str. 609	19 2	34 18 N	10 27	sp	17.124	
289	325	Prec. η Lyræ	19 6	38 44 N	32 18	nf	40.391	
290	325	Cygni 6	19 7	49 31 N	44 6	sp	10.576	
291	326	η Lyræ	19 8	38 51 N	5 58	nf	29.336	
292	327	θ Lyræ	19 10	37 49 N	17 52	nf	1 41.665	
293	328	H. C. 90, Struve 616	19 11	5 16 N	87 46	np	31.420	
294	329	H.C. 111, Struve 619	19 18	9 54 S	35 49	sf	11.314	
295	330	III. 57.	19 19	20 46 N	63 26	{np sf}	6.938	Changed + 4° 50′ in Pos. unchanged in Dist.
296	331	II. 69	19 21	36 10 N	23 16	{nf sp}	7.430	Changed + 5° 56′ in Pos.
297	332	β Cygni	19 24	27 35 N	35 15	nf	34.383	Unchanged.
298	334	Aquilæ 151	19 34	8 43 S	56 34	sf	1 37.112	
299	335	16 Cygni	19 37	50 6 N	45 13	{np sf}	37.504	Probably unchanged.
300	336	Struve 634.	19 38	33 14 N	56 15	np	……	
301	336	Anonyma nova 1 and 2	19 38	33 14 N	15 56	nf	23.467	
		——— 1 and 3			57 35	sf		
302	337	Struve, 635	19 38	77 52 N	68 30	nf	11.936	
303	338	Struve, 636 1 and 2	19 38	35 39 N	36 52	sf	15.133	
		——— 1 and 3			18 5	sp	2 19.831	
304	339	δ Cygni	19 39	44 42 N	—	—	——	Single
305	339	χ Cygni	19 40	33 20 N	16 42	nf	25.503	Probably unchanged.
*306	340	π Aquilæ	19 41	11 22 N	45 27	sf	1.957	Binary. Mean motion + 0°.314.
*307	340	ζ Sagittæ	19 41	18 43 N	44 32	np	8.818	Binary? Mean motion.
308	342	α Aquilæ	19 42	8 24 N	55 48	np	2 33.375	Common proper motion.
309	343	57 Aquilæ	19 45	8 42 S	81 8	sf	36.158	
310	344	Struve, 647.	19 45	19 53 N	58 30	{np sf}	42.427	
311	345	ε Draconis	19 49	69 48 N	85 21	np	2.590	Probably unchanged.
312	346	ψ Cygni.	19 51	51 58 N	88 0	sp	4.321	Unchanged in Pos.
313	348	I. 96 1 and 2	19 56	35 32 N	86 52	sf	2.467	}Hardly changed in Pos.
		——1 and 3			59 29	np	41.335	
314	349	H.C. 16, Struve 658	20 0	35 18 N	30 58	np	10.793	
		idem 1 and 3			61 48	nf	36.523	
315	351	Nova. H. and S.	20 0	35 17 N	33 26	sp	20.164	
316	352	Nova H. and S.	20 0	35 7 N	54 3	np	1 9.479	
317	353	II. 96	20 3	0 19 N	61 48	sp	4.100	Perhaps a slow change in Position
318	354	H. C. 182. Str. 665	20 6	4 2 S	36 33	sp	14.491	
319	355	α Capricorni	20 8	13 3 S	21 26	np	6 12.999	
320	355	I. 95.	20 14	54 48 N	69 39	np	3.980	
*321	356	κ Cephei	20 15	77 10 N	38 4	sf	8.138	Distance much increased 3″
322	358	ϱ Capricorni VI. 29	20 19	18 24 S	60 45	sf	3 58.021	
323	359	ϱ Capricorni II. 51.	20 20	18 24 S	87 17	sf	4.026	
324	361	ο 12 Capricorni	20 20	19 10 S	30 17	sp	22.060	
325	362	H. C. 109; Str. 680.	20 23	10 35 N	14 22	sp	15.484	
326	362	Anonyma (Nova)	20 32	38 5 N	88 43	np	9.478	
327	363	γ Delphini 1 and 2	20 38	15 29 N	3 43	np	12.317	
		——— 1 and 3			78 35	nf	2 20.857	

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INDEX.

Supplementary Stars; mostly imperfect measures.

No.	Page.	✱'s Names.	R. A.	Decl.	Angle of Position.	Quadrant.	Distance.	Remarks.
			h. m.	° ′	° ′			
361	398	Ceti, 27	0 2	4 4 S	18 45	*np*	9.000	Distance estimated.
362	399	Mira (ο) Ceti	2 10	3 48 S	1 25	*nf*	—	Changed both in position and distance
363	401	7 Tauri	3 24	23 51 N	33 54	*nf*	21.055	Distance estimated.
364	401	μ Persei	4 2	47 57 N	38 18	*sp*	1 31.559	
365	402	III. 65	4 24	40 43 N	59 0	*nf*	12.468	
366	403	41 Aurigæ	5 58	48 44 N	83 16	*np*	8.809	
367	404	Telescopii 15	6 26	41 40 N	43 0	*sf*	28.064	
368	404	63, *p*, Geminorum	7 17	21 49 N	56 16	*np*		
369	405	*nf*. 40 Lyncis	9 10	35 9 N	57 15	*nf*	3 22.287	
370	405	21 Ursæ Maj. 1 and 2	9 13	54 47 N	39 2	*np*	6.474	
		idem 1 and 3			74 36	*np*	4 45.000	
371	406	23 *h* Ursæ Maj.	9 17	63 51 N	0 33	*np*	27.332	
372	407	104 of the 145	11 7	15 22 S	36 ±	*np*	20 ±	
373	407	Camelop. 212	12 48	84 24 N	57 0	*np*	22.069	
374	408	ο 84 Virginis	13 34	4 27 N	40 9	*sp*	3.918	BINARY? Mean annual motion —0°.288
375	409	18 Libræ	14 49	10 24 S	54 8	*nf*	26.614	
376	410	24 Libræ 1 and 2	15 2	19 6 S	21 39	*sf*	50.629	
		——— 1 and 3			21 39	*sf*?	—	1, 2 and 3 are precisely in a line.
377	411	STRUVE 489	15 27	27 20 N	30 20	*sp*	5.941	
378	412	19 Ophiuchi	16 38	2 24 N	10 ±	*sf*	10....15	
379	412	40 of the 145	17 52	22 58 S	61 45	*sp*	10.952	
380	413	σ Capricorni	20 9	19 40 S	86 27	*sf*	53.704	

ERRATA AND ADDENDA.

Page 15, line 13, dele comma.

—— 31, —— 16. The formula here referred to is,

$$P = 360^\circ . \frac{t^2 + t'^2 + t''^2 + \&c.}{a\,t + a'\,t' + a''\,t'' + \&c.}$$

where a, a', a'', &c. are the Angles observed to be described in all the respective intervals of time between every two observations, which intervals are t, t', t'', &c. the angles being reckoned in degrees and decimals, the intervals in years and decimals. This value of P (the periodic time) makes the sum of the squares of the errors of observation a Minimum. The mean annual motion is $\frac{360^\circ}{P}$ or $\frac{a\,t + a'\,t' + \&c.}{t^2 + t'^2 + \&c.}$

Page 78, line 15, *for* 60°, *read* 62°.

—— 124, — 10, *for* Mean, *read* Near.

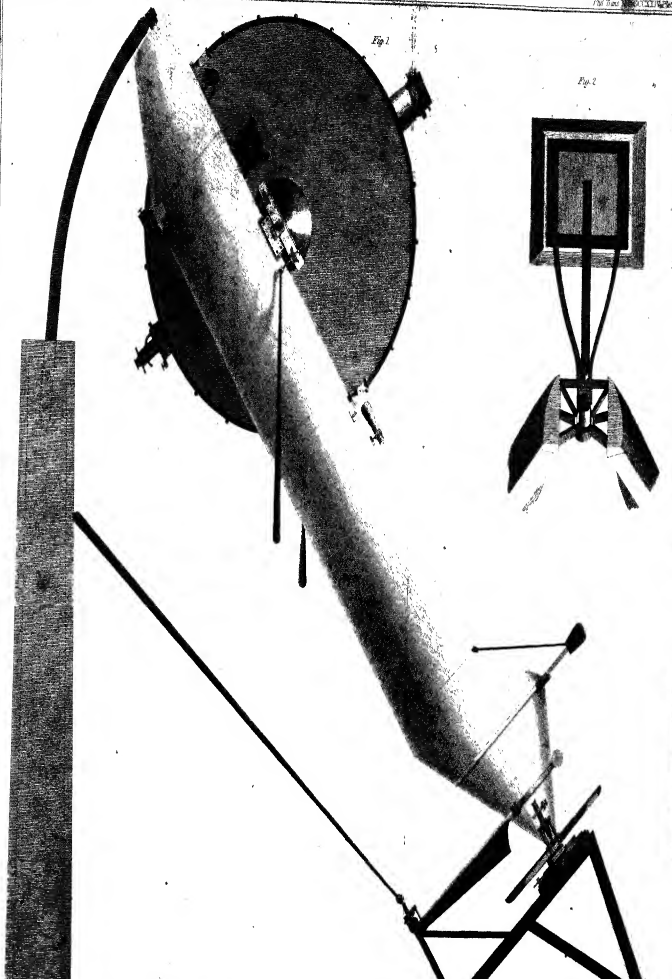
—— 301, 302, 303, *for* α Serpentis, *read* *d* Serpentis.

—— 210, line 11, from bottom, *for* position, *read* spaces.

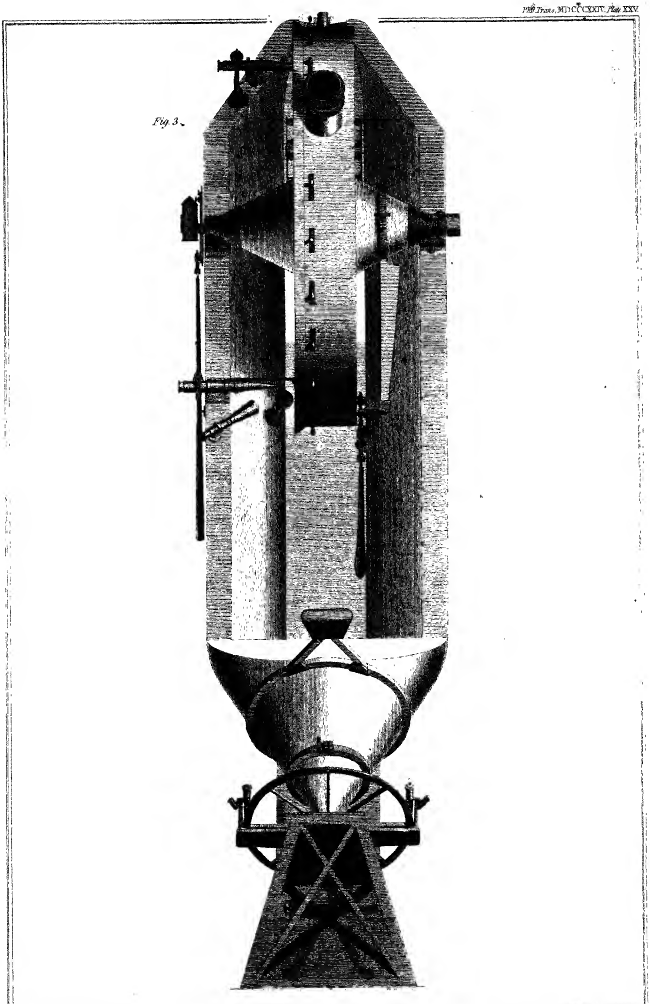
—— 292, Note on 70 Ophiuchi, added during the printing. By fifteen observations made at Passy, by Mr. SOUTH, in April and May of the present year, the angle of position at the Epoch 1825.31 was 53° 17′ or 53°.3, giving an apparent motion of 10°.1 in 2.0 years since the last observations in 1823, or 5°.050 per annum. This serves to render our observations of 1822 and 1823 yet more unaccountable, though it is still not easy to believe them erroneous, having been made with the greatest care. Mean while, if we take the whole interval from 1821 to 1825, the assemblage of our observations gives 3°.552 for the mean annual motion, so that the retardation of velocity noticed in p. 291 is on the whole satisfactorily confirmed. The distance remains nearly unchanged.

Plate IV. Fig. 4, *for* Bassel, *read* Bessel.

From the Press of
W. NICOL,
Cleveland-row, St. James's, London.



Scale one Inch to a Foot.



Thos Bradley delt

Front View.

Jas Basire sculpt

Eye piece half the real size

Fig. 4

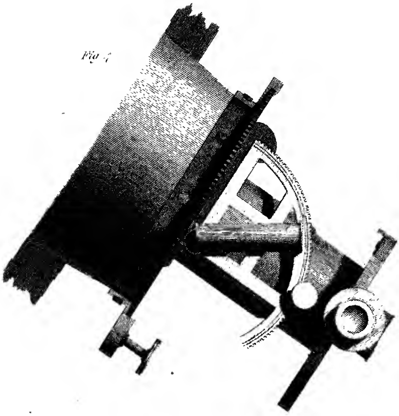
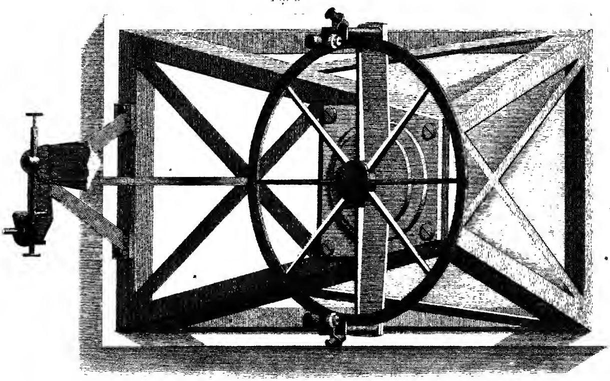


Fig. 5

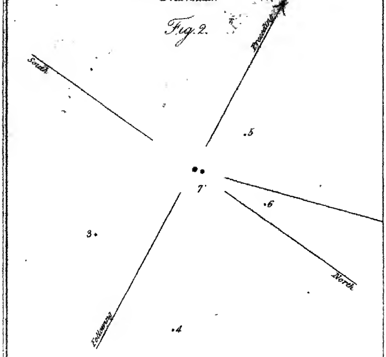


Plan of the Iron Frame. Hour Circle &c.

Thos. Bradley del.

Jas. Basire sculpt.

Fig. 2. ξ Bootis and the neighbouring Stars.
20 feet reflector.



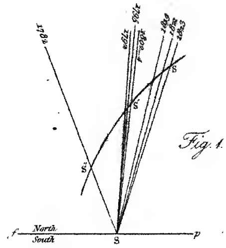


Fig. 1.—The apparent relative orbit of the two Stars of ξ Bootis.

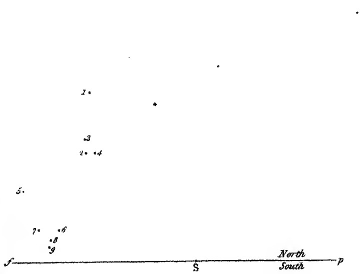


Fig. 4.—Shewing the different relative positions of the two Stars 61 Cygni and its companion at different times and according to different observers.

S. the Large Star
1 Bradley's position of the Small Star in 1753
2 Mayer's in . . 1778
3 Sir W. Herschel. 1781
4 Lalande 1793
5 Piazzi . . 1800
6 Piazzi . . 1805
7 Bessel 1812
8 Struve 1819
9 Herschel & South 1821

Fig. 3; 61 Cygni and the neighbouring Stars as seen in the 20 feet reflector Sep. 16. 1823.

1 = 6 mag.	11 = 14 mag.
2 = 6½ m.	12 = 7 = 16 m.
3 = 10 m.	13 = 3 = 10 m.
4 = 16 m.	14 = 3 = 10 m.
5 = 19 m.	15 = 14 m.
6 = 14 m.	16 = 14 m.
7 = 15 m.	17 = 14 m.
8 = 17 m.	18 = 14 m.
9 = 17 m.	19 = 15 m.
10 = 13 m.	

J. Basire, sc.